# Notice

**SANYO**

☑ CORRECTION     ☐ PRODUCTION CHANGE

☐ SERVICE FLASH     ☑ ADDED INFORMATION

FILE NO.

Please add this notice to the **TECHNICAL & SERVICE MANUAL** listed below.

Category :    DC INVERTER MULTI-SYSTEM AIR CONDITIONER      Date :   Sept., 2006

Model :     CLM1972  CLM2472  CLM3172

Destination :   North America

Serial No. :

Issue Number :    1

| Capacity at 230V | Outdoor Model No. | Product Code No. |
|---|---|---|
| 19,700 BTU/h | CLM1972 | 1 852 330 33 |
| 25,400 BTU/h | CLM2472 | 1 852 330 34 |
| 30,600 BTU/h | CLM3172 | 1 852 330 35 |

< Reference No. >

| Current |
|---|
| SM700680 |

➡

| New |
|---|
| SM700680-01 |
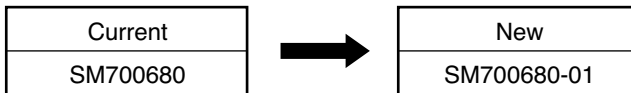
The reason for change

A : Correction     B : Quality reliability     C : Standardization

D : Design change     E : Addition of parts     F : New information

| Page No. of the Manual | Contents | Reason for change |
|---|---|---|
| 5 | " 1. OPERATING RANGE " has been corrected. | A |
| 6 to 11 | Sensible Capacity and Latent Capacity have been added in " 2-1. Unit Specifications ". | F |
| 22 to 35 | " 5-1. Temperature charts " have been added in " 5. PERFORMANCE DATA ". | F |

# TECHNICAL & SERVICE MANUAL

## OUTDOOR UNIT : CLM1972
## CLM2472
## CLM3172

**SANYO**

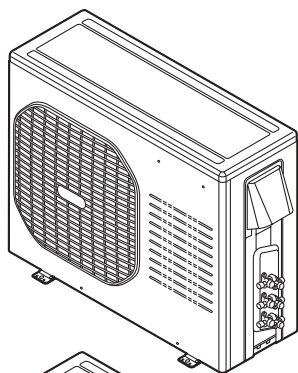**Destination: North America**

# DC INVERTER MULTI-SYSTEM AIR CONDITIONER

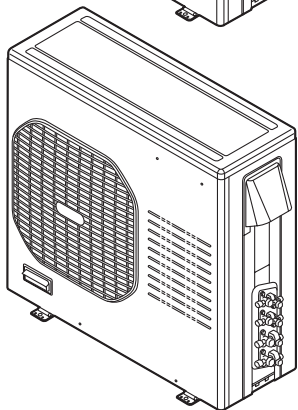| Capacity at 230V | Outdoor Model No. | Product Code No. |
|---|---|---|
| 19,700 BTU/h | CLM1972 | 1 852 330 33 |
| 25,400 BTU/h | CLM2472 | 1 852 330 34 |
| 30,600 BTU/h | CLM3172 | 1 852 330 35 |

**CLM1972**



**CLM2472**
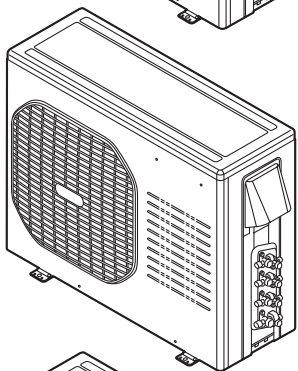


**CLM3172**



**< Applicable Indoor Units >**

●Wall mounted type
 KMS0772
 KMS0972
 KMS1272
 KMS1872
 KMS2472

**NOTE**

For details about the combination, refer to "Unit Combination Table" in the Appendix of this manual.

**IMPORTANT**

These air conditioners employ new refrigerant R410A.

Pay special attention when servicing the unit.

**R410A**

# Important!
# Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

**For safe installation and trouble-free operation, you must:**
- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.

⚠ **WARNING** — This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

⚠ **CAUTION** — This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

## If Necessary, Get Help
These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

### In Case of Improper Installation
The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

## SPECIAL PRECAUTIONS

**WARNING**  When Wiring

⚡ ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.
- Ground the unit following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

## When Transporting
Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

## When Installing

### In a Ceiling or Wall
Make sure the ceiling/wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.

### In a Room
Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

### In Moist or Uneven Locations
Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

### In an Area with High Winds
Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

### In a Snowy Area (for Heat Pump-type Systems)
Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

## When Connecting Refrigerant Tubing
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

## When Servicing
- Turn the power off at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.

## Others

⚠ **CAUTION**

- Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm upon completing installation that no refrigerant gas is leaking. If escaped gas comes in contact with a stove, gas water heater, electric room heater or other heat source, it can produce dangerously toxic gas.

# Table of Contents

# ■ APPLICABLE INDOOR UNITS

| Multi-Outdoor Unit / Indoor Unit | | KMS0772 | KMS0972 | KMS1272 | KMS1872 | KMS2472 |
|---|---|---|---|---|---|---|
| 3-Room | CLM1972 | YES | YES | YES | YES | NO |
| 4-Room | CLM2472 | YES | YES | YES | YES | YES |
| 4-Room | CLM3172 | YES | YES | YES | YES | YES |

**NOTE** The table lists the wall-mounted type of indoor units as representative models.

# 1. OPERATING RANGE

| | Temperature | Indoor Air Intake Temp. | Outdoor Air Intake Temp. |
|---|---|---|---|
| Cooling | Maximum | 95 °F D.B. / 71 °F W.B. | 115 °F D.B. |
| | Minimum | 67 °F D.B. / 57 °F W.B. | *1 |

*1 32 °F D.B.: When combined with KMS1872 or KMS2472
   23 °F D.B.: When combined with KMS0772, KMS0972 or KMS1272

# 2. SPECIFICATIONS
## 2-1. Unit Specifications

Outdoor Unit **CLM1972**
Indoor Unit **KMS0972** X **3**

**< 230V >**

| Type | 3-Room Multi Outdoor Unit |
|---|---|
| **Number of Connectable Indoor Units** | 3 |
| **Number of Operatable Indoor Units** | 3 |

| **Voltage Rating** | 230V Single-Phase 60Hz |
|---|---|

| **Performance** | | Cooling |
|---|---|---|
| Total Capacity | BTU/h | 19,700 ( 9,800 to 19,700 ) |
| | kW | 5.80 ( 2.90 to 5.80 ) |
| Sensible Capacity | BTU/h | 16,800 |
| Latent Capacity | BTU/h | 2,900 |
| Air Circulation (High) | ft³/min (m³/h) | 1,707 (2,900) |

| **Electrical Rating** | | Cooling |
|---|---|---|
| Available Voltage Range | V | 187 to 253 |
| Running Amperes | A | 7.0 |
| Power Input | W | 1,570 |
| Power Factor | % | 98 |
| SEER | BTU/W | 13 |
| Compressor Locked Rotor Amperes | A | 13.0 |
| Fuse or Circuit Breaker Capacity | A | 20 |

| **Features ( Outdoor Unit )** | | |
|---|---|---|
| Control | | Microprocessor |
| Fan Speeds | | Auto ( Hi and multi-steps ) |
| Compressor | | DC Twin Rotary (Inverter) |
| Refrigerant / Amount charged at shipment | lb. (g) | R410A / 6.17 (2,800) |
| Refrigerant Control | | Electric Expansion Valve |
| Operation Sound (High) Cool | dB-A | 50 |
| Refrigerant Tubing Connections | | Flare Type |
| Max. allowable tubing length per unit | ft. (m) | 82 (25) |
| Refrigerant | Narrow tube | inch (mm) | 1/4 (6.35) x 3 |
| Tube Diameter | Wide tube | inch (mm) | 3/8 (9.52) x 3 |

| **Dimensions & Weight ( Outdoor Unit )** | | | |
|---|---|---|---|
| Unit Dimensions | | inch | 29-1/8 x 35-7/16 x 12-19/32 |
| Height x Width x Depth | | (mm) | (740 x 900 x 320) |
| Package Dimensions | | inch | 33-27/32 x 40-5/8 x 16-1/4 |
| Height x Width x Depth | | (mm) | (860 x 1,032 x 413) |
| Weight | Net | lb. (kg) | 138.9 (63.0) |
| | Shipping | lb. (kg) | 147.7 (67.0) |
| Shipping Volume | | cu.ft (m³) | 12.71 (0.36) |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:**

1. The Values shown in performance section and electrical rating section above are based on the following unit combination. For other combination unit, please refer to the "Unit Combination Tables" in this manual.

        Indoor Unit : KMS0972  3units     Outdoor Unit : CLM1972  1unit

2. Rating conditions are:  Cooling : Indoor air temp.    80°F D.B./ 67°F W.B.

                             Outdoor air temp.  95°F D.B./ 75°F W.B.

Outdoor Unit  **CLM1972**
Indoor Unit  **KMS0972** X **3**

<div align="right">

**< 208V >**

</div>

| Type | 3-Room Multi Outdoor Unit |
|---|---|
| **Number of Connectable Indoor Units** | 3 |
| **Number of Operatable Indoor Units** | 3 |

| Voltage Rating | 208V Single-Phase 60Hz |
|---|---|

| **Performance** | | Cooling |
|---|---|---|
| Total Capacity | BTU/h | 19,700 ( 9,800 to 19,700 ) |
| | kW | 5.80 ( 2.90 to 5.80 ) |
| Sensible Capacity | BTU/h | 16,800 |
| Latent Capacity | BTU/h | 2,900 |
| Air Circulation (High) | ft³/min (m³/h) | 1,707 (2,900) |

| **Electrical Rating** | | Cooling |
|---|---|---|
| Available Voltage Range | V | 187 to 253 |
| Running Amperes | A | 7.7 |
| Power Input | W | 1,570 |
| Power Factor | % | 98 |
| SEER | BTU/W | 13 |
| Compressor Locked Rotor Amperes | A | 13.0 |
| Fuse or Circuit Breaker Capacity | A | 20 |

| **Features ( Outdoor Unit )** | | |
|---|---|---|
| Control | | Microprocessor |
| Fan Speeds | | Auto ( Hi and multi-steps ) |
| Compressor | | DC Twin Rotary (Inverter) |
| Refrigerant / Amount charged at shipment | lb. (g) | R410A / 6.17 (2,800) |
| Refrigerant Control | | Electric Expansion Valve |
| Operation Sound (High) Cool | dB-A | 50 |
| Refrigerant Tubing Connections | | Flare Type |
| Max. allowable tubing length per unit | ft. (m) | 82 (25) |
| Refrigerant | Narrow tube | inch (mm) | 1/4 (6.35) x 3 |
| Tube Diameter | Wide tube | inch (mm) | 3/8 (9.52) x 3 |

| **Dimensions & Weight ( Outdoor Unit )** | | | |
|---|---|---|---|
| Unit Dimensions | | inch | 29-1/8 x 35-7/16 x 12-19/32 |
| Height x Width x Depth | | (mm) | (740 x 900 x 320) |
| Package Dimensions | | inch | 33-27/32 x 40-5/8 x 16-1/4 |
| Height x Width x Depth | | (mm) | (860 x 1,032 x 413) |
| Weight | Net | lb. (kg) | 138.9 (63.0) |
| | Shipping | lb. (kg) | 147.7 (67.0) |
| Shipping Volume | | cu.ft (m³) | 12.71 (0.36) |

<div align="right">

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

</div>

**Remarks:**

1.The Values shown in performance section and electrical rating section above are based on the following unit combination.
  For other combination unit, please refer to the "Unit Combination Tables" in this manual.

        Indoor Unit : KMS0972  3units     Outdoor Unit : CLM1972  1unit

2.Rating conditions are:  Cooling : Indoor air temp.   80°F D.B./ 67°F W.B.

                           Outdoor air temp.  95°F D.B./ 75°F W.B.

Outdoor Unit  **CLM2472**
Indoor Unit  **KMS0972** X **3**

| Type | 4-Room Multi Outdoor Unit |
|---|---|
| **Number of Connectable Indoor Units** | 4 |
| **Number of Operatable Indoor Units** | 3 |

| **Voltage Rating** | 230V Single-Phase 60Hz |
|---|---|

| **Performance** | | Cooling |
|---|---|---|
| Total Capacity | BTU/h | 25,400 ( 9,800 to 25,400 ) |
| | kW | 7.50 ( 2.90 to 7.50 ) |
| Sensible Capacity | BTU/h | 21,400 |
| Latent Capacity | BTU/h | 4,000 |
| Air Circulation (High) | ft³/min (m³/h) | 1,707 (2,900) |

| **Electrical Rating** | | Cooling |
|---|---|---|
| Available Voltage Range | V | 187 to 253 |
| Running Amperes | A | 11.3 |
| Power Input | W | 2,560 |
| Power Factor | % | 98 |
| SEER | BTU/W | 13 |
| Compressor Locked Rotor Amperes | A | 13.0 |
| Fuse or Circuit Breaker Capacity | A | 20 |

| **Features ( Outdoor Unit )** | | |
|---|---|---|
| Control | | Microprocessor |
| Fan Speeds | | Auto ( Hi and multi-steps ) |
| Compressor | | DC Twin Rotary (Inverter) |
| Refrigerant / Amount charged at shipment | lb. (g) | R410A / 6.17 (2,800) |
| Refrigerant Control | | Electric Expansion Valve |
| Operation Sound (High) Cool | dB-A | 50 |
| Refrigerant Tubing Connections | | Flare Type |
| Max. allowable tubing length per unit | ft. (m) | 82 (25) |
| Refrigerant | Narrow tube | inch (mm) | 1/4 (6.35) x 4 |
| Tube Diameter | Wide tube | inch (mm) | 3/8 (9.52) x 3 + 1/2 (12.7) x 1 |

| **Dimensions & Weight ( Outdoor Unit )** | | | |
|---|---|---|---|
| Unit Dimensions | | inch | 29-1/8 x 35-7/16 x 12-19/32 |
| Height x Width x Depth | | (mm) | (740 x 900 x 320) |
| Package Dimensions | | inch | 33-27/32 x 40-5/8 x 16-1/4 |
| Height x Width x Depth | | (mm) | (860 x 1,032 x 413) |
| Weight | Net | lb. (kg) | 138.9 (63.0) |
| | Shipping | lb. (kg) | 147.7 (67.0) |
| Shipping Volume | | cu.ft (m³) | 12.71 (0.36) |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:**

1.The Values shown in performance section and electrical rating section above are based on the following unit combination.
For other combination unit, please refer to the "Unit Combination Tables" in this manual.

Indoor Unit : KMS0972  3units        Outdoor Unit : CLM2472  1unit

2.Rating conditions are:  Cooling : Indoor air temp.   80°F D.B./ 67°F W.B.

Outdoor air temp.  95°F D.B./ 75°F W.B.

Outdoor Unit **CLM2472**
Indoor Unit **KMS0972** X **3**

| Type | 4-Room Multi Outdoor Unit |
|---|---|
| **Number of Connectable Indoor Units** | 4 |
| **Number of Operatable Indoor Units** | 3 |

| Voltage Rating | 208V Single-Phase 60Hz |
|---|---|

| **Performance** | | Cooling |
|---|---|---|
| Total Capacity | BTU/h | 24,400 ( 9,800 to 24,400 ) |
| | kW | 7.20 ( 2.90 to 7.20 ) |
| Sensible Capacity | BTU/h | 20,600 |
| Latent Capacity | BTU/h | 3,800 |
| Air Circulation (High) | ft$^3$/min (m$^3$/h) | 1,707 (2,900) |

| **Electrical Rating** | | Cooling |
|---|---|---|
| Available Voltage Range | V | 187 to 253 |
| Running Amperes | A | 12.5 |
| Power Input | W | 2,560 |
| Power Factor | % | 98 |
| SEER | BTU/W | 13 |
| Compressor Locked Rotor Amperes | A | 13.0 |
| Fuse or Circuit Breaker Capacity | A | 20 |

| **Features ( Outdoor Unit )** | | |
|---|---|---|
| Control | | Microprocessor |
| Fan Speeds | | Auto ( Hi and multi-steps ) |
| Compressor | | DC Twin Rotary (Inverter) |
| Refrigerant / Amount charged at shipment | lb. (g) | R410A / 6.17 (2,800) |
| Refrigerant Control | | Electric Expansion Valve |
| Operation Sound (High) Cool | dB-A | 50 |
| Refrigerant Tubing Connections | | Flare Type |
| Max. allowable tubing length per unit | ft. (m) | 82 (25) |
| Refrigerant | Narrow tube | inch (mm) | 1/4 (6.35) x 4 |
| Tube Diameter | Wide tube | inch (mm) | 3/8 (9.52) x 3 + 1/2 (12.7) x 1 |

| **Dimensions & Weight ( Outdoor Unit )** | | | |
|---|---|---|---|
| Unit Dimensions | | inch | 29-1/8 x 35-7/16 x 12-19/32 |
| Height x Width x Depth | | (mm) | (740 x 900 x 320) |
| Package Dimensions | | inch | 33-27/32 x 40-5/8 x 16-1/4 |
| Height x Width x Depth | | (mm) | (860 x 1,032 x 413) |
| Weight | Net | lb. (kg) | 138.9 (63.0) |
| | Shipping | lb. (kg) | 147.7 (67.0) |
| Shipping Volume | | cu.ft (m$^3$) | 12.71 (0.36) |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:**

1.The Values shown in performance section and electrical rating section above are based on the following unit combination.
   For other combination unit, please refer to the "Unit Combination Tables" in this manual.

   Indoor Unit : KMS0972  3units      Outdoor Unit : CLM2472  1unit

2.Rating conditions are:  Cooling : Indoor air temp.   80°F D.B./ 67°F W.B.

   Outdoor air temp.  95°F D.B./ 75°F W.B.

Outdoor Unit **CLM3172**
Indoor Unit **KMS0972** X **4**

| Type | 4-Room Multi Outdoor Unit |
|---|---|
| **Number of Connectable Indoor Units** | 4 |
| **Number of Operatable Indoor Units** | 4 |

| Voltage Rating | 230V Single-Phase 60Hz |
|---|---|

| **Performance** | | Cooling |
|---|---|---|
| Total Capacity | BTU/h | 30,600 ( 9,800 to 30,600 ) |
| | kW | 9.00 ( 2.90 to 9.00 ) |
| Sensible Capacity | BTU/h | 25,800 |
| Latent Capacity | BTU/h | 4,800 |
| Air Circulation (High) | ft³/min (m³/h) | 1,942 (3,300) |

| **Electrical Rating** | | Cooling |
|---|---|---|
| Available Voltage Range | V | 187 to 253 |
| Running Amperes | A | 12.3 |
| Power Input | W | 2,800 |
| Power Factor | % | 99 |
| SEER | BTU/W | 13 |
| Compressor Locked Rotor Amperes | A | 17.0 |
| Fuse or Circuit Breaker Capacity | A | 20 |

| **Features ( Outdoor Unit )** | | |
|---|---|---|
| Control | | Microprocessor |
| Fan Speeds | | Auto ( Hi and multi-steps ) |
| Compressor | | DC Twin Rotary (Inverter) |
| Refrigerant / Amount charged at shipment | lb. (g) | R410A / 8.38 (3,800) |
| Refrigerant Control | | Electric Expansion Valve |
| Operation Sound (High) Cool | dB-A | 53 |
| Refrigerant Tubing Connections | | Flare Type |
| Max. allowable tubing length per unit | ft. (m) | 100 (30.5) |
| Refrigerant | Narrow tube | inch (mm) | 1/4 (6.35) x 4 |
| Tube Diameter | Wide tube | inch (mm) | 3/8 (9.52) x 2 + 1/2 (12.7) x 2 |

| **Dimensions & Weight ( Outdoor Unit )** | | | |
|---|---|---|---|
| Unit Dimensions | | inch | 35-1/32 x 35-7/16 x 12-19/32 |
| Height x Width x Depth | | (mm) | (890 x 900 x 320) |
| Package Dimensions | | inch | 39-3/4 x 40-5/8 x 16-1/4 |
| Height x Width x Depth | | (mm) | (1,010 x 1,032 x 413) |
| Weight | Net | lb. (kg) | 174.2 (79.0) |
| | Shipping | lb. (kg) | 183.0 (83.0) |
| Shipping Volume | | cu.ft (m³) | 15.18 (0.43) |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:**

1. The Values shown in performance section and electrical rating section above are based on the following unit combination. For other combination unit, please refer to the "Unit Combination Tables" in this manual.

        Indoor Unit : KMS0972  4units      Outdoor Unit : CLM3172  1unit

2. Rating conditions are:  Cooling : Indoor air temp.   80°F D.B./ 67°F W.B.

                                Outdoor air temp.  95°F D.B./ 75°F W.B.

Outdoor Unit  **CLM3172**
Indoor Unit   **KMS0972** X **4**

| Type | 4-Room Multi Outdoor Unit |
|---|---|
| **Number of Connectable Indoor Units** | 4 |
| **Number of Operatable Indoor Units** | 4 |

| **Voltage Rating** | 208V Single-Phase 60Hz |
|---|---|

| **Performance** | | Cooling |
|---|---|---|
| Total Capacity | BTU/h | 28,600 ( 9,800 to 28,600 ) |
| | kW | 8.40 ( 2.90 to 8.40 ) |
| Sensible Capacity | BTU/h | 24,200 |
| Latent Capacity | BTU/h | 4,400 |
| Air Circulation (High) | ft³/min (m³/h) | 1,942 (3,300) |

| **Electrical Rating** | | Cooling |
|---|---|---|
| Available Voltage Range | V | 187 to 253 |
| Running Amperes | A | 13.6 |
| Power Input | W | 2,800 |
| Power Factor | % | 99 |
| SEER | BTU/W | 13 |
| Compressor Locked Rotor Amperes | A | 17.0 |
| Fuse or Circuit Breaker Capacity | A | 20 |

| **Features ( Outdoor Unit )** | | |
|---|---|---|
| Control | | Microprocessor |
| Fan Speeds | | Auto ( Hi and multi-steps ) |
| Compressor | | DC Twin Rotary (Inverter) |
| Refrigerant / Amount charged at shipment | lb. (g) | R410A / 8.38 (3,800) |
| Refrigerant Control | | Electric Expansion Valve |
| Operation Sound (High) Cool | dB-A | 53 |
| Refrigerant Tubing Connections | | Flare Type |
| Max. allowable tubing length per unit | ft. (m) | 100 (30.5) |
| Refrigerant | Narrow tube | inch (mm) | 1/4 (6.35) x 4 |
| Tube Diameter | Wide tube | inch (mm) | 3/8 (9.52) x 2 + 1/2 (12.7) x 2 |

| **Dimensions & Weight ( Outdoor Unit )** | | | |
|---|---|---|---|
| Unit Dimensions | | inch | 35-1/32 x 35-7/16 x 12-19/32 |
| Height x Width x Depth | | (mm) | (890 x 900 x 320) |
| Package Dimensions | | inch | 39-3/4 x 40-5/8 x 16-1/4 |
| Height x Width x Depth | | (mm) | (1,010 x 1,032 x 413) |
| Weight | Net | lb. (kg) | 174.2 (79.0) |
| | Shipping | lb. (kg) | 183.0 (83.0) |
| Shipping Volume | | cu.ft (m³) | 15.18 (0.43) |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:**

1.The Values shown in performance section and electrical rating section above are based on the following unit combination.
   For other combination unit, please refer to the "Unit Combination Tables" in this manual.

   Indoor Unit : KMS0972  4units       Outdoor Unit : CLM3172  1unit

2.Rating conditions are:  Cooling : Indoor air temp.   80°F D.B./ 67°F W.B.

   Outdoor air temp.  95°F D.B./ 75°F W.B.

# 2-2. Major Component Specifications

## 2-2-1. Outdoor Unit

Outdoor Unit    **CLM1972**

| Control PCB | |
|---|---|
| Part No. | CB-CLM1972 |
| Controls | Microprocessor |
| Control Circuit Fuse | 250V 25A |

| Compressor | | |
|---|---|---|
| Type | | DC Twin Rotary (Hermetic) |
| Compressor Model / Nominal Output | | 5KD240XAB21 / 1,700W |
| Compressor Oil ... Amount | Pints (cc) | FV50S ... 1.91 (900) |
| Coil Resistance | Ohm | U - V : 0.720 |
| (Ambient Temp. 68°F (20°C)) | | V - W : 0.708 |
| | | W - U : 0.726 |
| Safety Device | | |
| CT (Peak current cut-off control) | | Yes |
| Compressor Discharge Temp. Control | | Yes |
| Operation cut-off control in abnormal ambient Temp. | | Yes |
| Overload Relay | Model | CS-7LN115 |
| | Operation Temp. | Open : 239 °F(115 °C),  Close : 212 °F(100 °C) |
| Run Capacitor | Micro F | - |
| | VAC | - |
| Crankcase Heater | | 230V 30W |

| Fan | | |
|---|---|---|
| Type | | Propeller |
| Q'ty ... Dia. | inch (mm) | 1 ... D18 -1/8 (D460) |

| Fan Motor | | |
|---|---|---|
| Type | | DC Motor |
| Model ... Q'ty | | SIC-71FW-D490-1 ... 1 |
| No. of Poles | | 8 |
| Rough Measure RPM (Cool) | | 750 |
| Nominal Output | W | 90 |
| Coil Resistance | Ohm | |
| (Ambient Temp. 68 °F (20°C)) | | - |
| Safety Device | | |
| Type | | Internal Controller |
| Over- Current Protection | | Yes |
| Over- Heat Protection | | Yes |
| Run Capacitor | Micro F | - |
| | VAC | – |

| Heat Exchanger Coil | | |
|---|---|---|
| Coil | | Aluminum Plate Fin / Copper Tube |
| Rows | | 2 |
| Fins per inch | | 18.1 |
| Face Area | ft² (m²) | 6.40 (0.595) |

| External Finish | Acrylic baked-on enamel finish |
|---|---|

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Outdoor Unit **CLM2472**

| Control  PCB | |
|---|---|
| Part No. | CB-CLM2572 |
| Controls | Microprocessor |
| Control Circuit Fuse | 250V 25A |

| Compressor | |
|---|---|
| Type | DC Twin Rotary (Hermetic) |
| Compressor Model / Nominal Output | 5KD240XAB21 / 1,700W |
| Compressor Oil ...  Amount                      Pints  (cc) | FV50S ... 1.91 (900) |
| Coil Resistance                                              Ohm<br>(Ambient Temp. 68°F (20 °C)) | U - V :  0.720<br>V - W :  0.708<br>W - U :  0.726 |
| Safety Device | |
|     CT (Peak current cut-off control) | Yes |
|     Compressor Discharge Temp. Control | Yes |
|     Operation cut-off control in abnormal ambient Temp. | Yes |
|     Overload Relay                                  Model | CS-7LN115 |
|                                     Operation Temp. | Open : 239 °F(115 °C),  Close : 212 °F(100 °C) |
| Run Capacitor                                          Micro F | - |
|                                                        VAC | - |
| Crankcase Heater | 230V 30W |

| Fan | |
|---|---|
| Type | Propeller |
| Q'ty ... Dia.                                              inch (mm) | 1 ... D18 -1/8 (D460) |

| Fan  Motor | |
|---|---|
| Type | DC Motor |
| Model ... Q'ty | SIC-71FW-D490-1 ... 1 |
| No. of Poles | 8 |
| Rough Measure RPM (Cool) | 750 |
| Nominal Output                                            W | 90 |
| Coil Resistance                                           Ohm<br>(Ambient Temp. 68 °F (20 °C)) | - |
| Safety Device | |
|     Type | Internal Controller |
|     Over- Current Protection | Yes |
|     Over- Heat Protection | Yes |
| Run Capacitor                                          Micro F | - |
|                                                        VAC | – |

| Heat  Exchanger  Coil | |
|---|---|
| Coil | Aluminum Plate Fin / Copper Tube |
| Rows | 2 |
| Fins per inch | 18.1 |
| Face Area                                     ft$^2$ (m$^2$) | 6.40 (0.595) |

| External  Finish | Acrylic baked-on enamel finish |
|---|---|

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Outdoor Unit   **CLM3172**

| Control PCB | |
|---|---|
| Part No. | CB-CLM3172 |
| Controls | Microprocessor |
| Control Circuit Fuse | 250V 25A |

| Compressor | | |
|---|---|---|
| Type | | DC Twin Rotary (Hermetic) |
| Compressor Model / Nominal Output | | 5JD420XAB22 / 3,000W |
| Compressor Oil ... Amount | Pints (cc) | FV50S ... 2.55 (1,200) |
| Coil Resistance | Ohm | U - V :  0.435 |
| (Ambient Temp. 68°F (20°C)) | | V - W :  0.441 |
| | | W - U :  0.452 |
| Safety Device | | |
| CT (Peak current cut-off control) | | Yes |
| Compressor Discharge Temp. Control | | Yes |
| Operation cut-off control in abnormal ambient Temp. | | Yes |
| Overload Relay | Model | CS-7LN115 |
| | Operation Temp. | Open : 239 °F(115 °C),  Close : 212 °F(100 °C) |
| Run Capacitor | Micro F | - |
| | VAC | - |
| Crankcase Heater | | 230V 30W |

| Fan | | |
|---|---|---|
| Type | | Propeller |
| Q'ty ... Dia. | inch (mm) | 1 ... D18 -1/8 (D460) |

| Fan Motor | | |
|---|---|---|
| Type | | DC Motor |
| Model ... Q'ty | | SIC-71FW-D490-1 ... 1 |
| No. of Poles | | 8 |
| Rough Measure RPM (Cool) | | 800 |
| Nominal Output | W | 90 |
| Coil Resistance | Ohm | |
| (Ambient Temp. 68 °F (20°C)) | | - |
| Safety Device | | |
| Type | | Internal Controller |
| Over- Current Protection | | Yes |
| Over- Heat Protection | | Yes |
| Run Capacitor | Micro F | - |
| | VAC | – |

| Heat Exchanger Coil | |
|---|---|
| Coil | Aluminum Plate Fin / Copper Tube |
| Rows | 2 |
| Fins per inch | 18.1 |
| Face Area      ft$^2$ (m$^2$) | 7.75 (0.72) |

| External Finish | Acrylic baked-on enamel finish |
|---|---|

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

# 2-3. Other Component Specifications

| Sensor Name | Model No. of sensor | Quantity of Sensor | | |
|---|---|---|---|---|
| | | CLM1972 | CLM2472 | CLM3172 |
| Outdoor air temp sensor | TKS295B | 1 | 1 | 1 |
| Outdoor heat exchanger sensor | TKS292B | 1 | 1 | 1 |
| AW / AN sensor | TKS292B | 1 / 1 | 1 / 1 | 1 / 1 |
| BW / BN sensor | TKS292B | 1 / 1 | 1 / 1 | 1 / 1 |
| CW / CN sensor | TKS292B | 1 / 1 | 1 / 1 | 1 / 1 |
| DW / DN sensor | TKS292B | 0 | 1 / 1 | 1 / 1 |



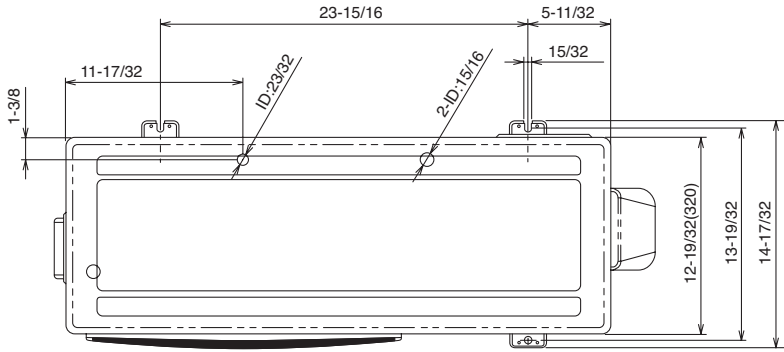| Sensor Name | Model No. of sensor | Quantity of Sensor | | |
|---|---|---|---|---|
| | | CLM1972 | CLM2472 | CLM3172 |
| Compressor temp sensor | TKS293B | 1 | 1 | 1 |
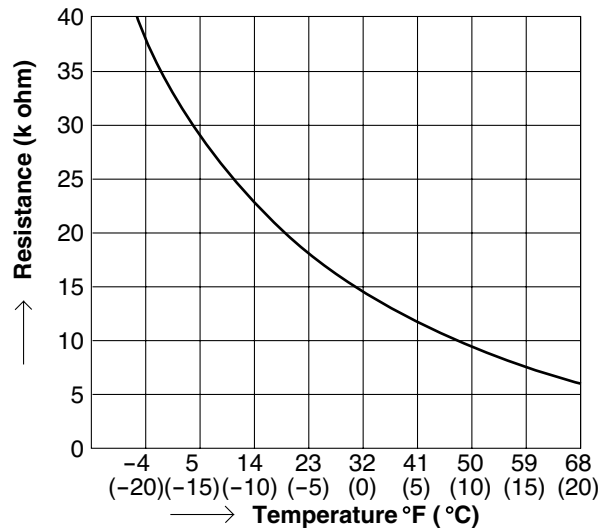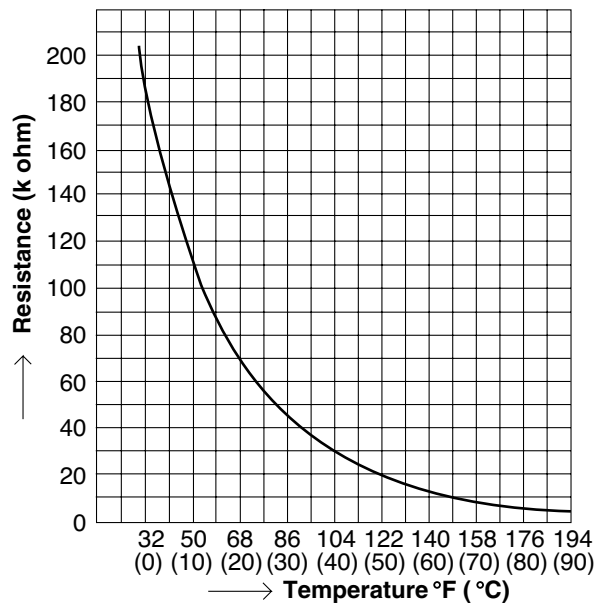
# 3. DIMENSIONAL DATA

Outdoor Unit     **CLM1972**



23-15/16

5-11/32

11-17/32

1-3/8

15/32

ID:23/32

2-ID:15/16

12-19/32(320)

13-19/32

14-17/32

35-7/16(900)

2-15/16

29-1/8(740)

23/32

1-13/16

2-1/16

Wide tube service valve
dia.3/8" (9.52) × 3

Narrow tube service valve
dia.1/4" (6.35) × 3

5-29/32

2-27/32

2-3/4

2-15/16

2-3/4

4-7/16

2-1/32

4-1/2
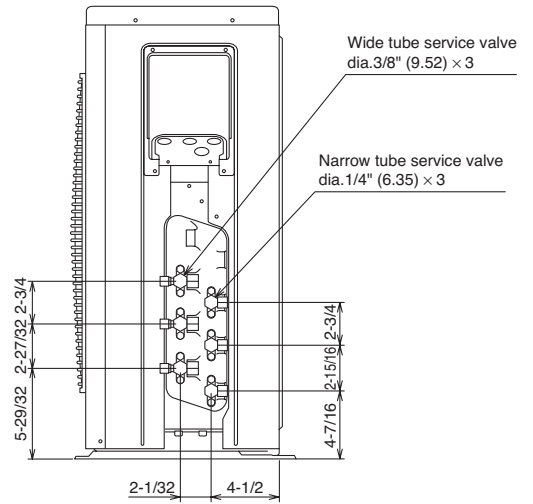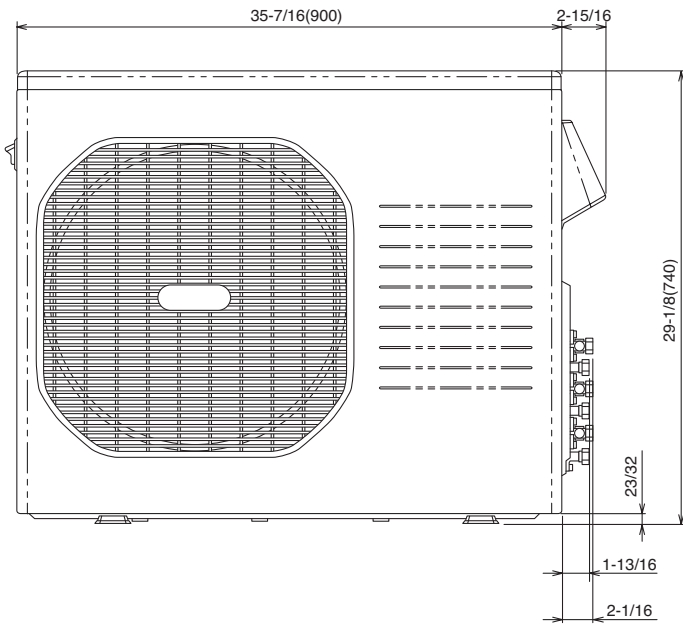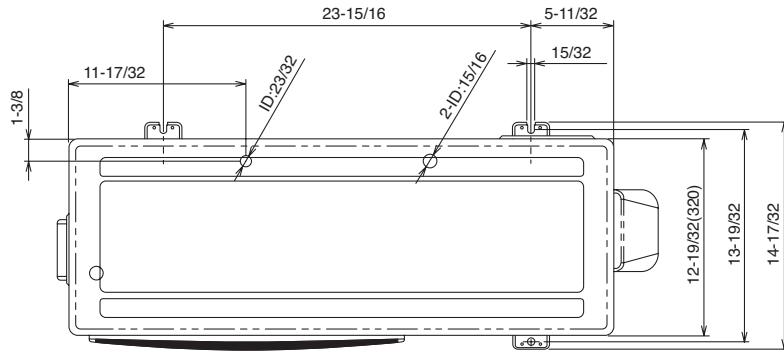
Unit: inch(mm)

Outdoor Unit    **CLM2472**

23-15/16
5-11/32
11-17/32
1-3/8
ID-23/32
2-ID-15/16
15/32
12-19/32(320)
13-19/32
14-17/32

35-7/16(900)
2-15/16
29-1/8(740)
23/32
1-13/16
2-1/16
2-13/32

Wide tube service valve
dia.3/8" (9.52) × 3

Narrow tube service valve
dia.1/4" (6.35) × 4

Wide tube service valve
dia.1/2" (12.70) × 1

2-3/4
2-3/4 2-3/4
2-27/32 2-3/4
2-3/4 2-3/4
5-29/32
2-15/16 2-3/4
4-7/16

2-1/32
4-1/2

Unit: inch(mm)

17

Outdoor Unit     **CLM3172**

23-15/16

5-11/32

11-17/32

15/32

1-3/8

ID-23/32

2-ID-15/16

12-19/32(320)

13-19/32

14-17/32

35-7/16(900)

2-15/16

35-1/32(890)

Wide tube service valve
dia.3/8" (9.52) × 2

Narrow tube service valve
dia.1/4" (6.35) × 4

Wide tube service valve
dia.1/2" (12.70) × 2

23/32

1-13/16

2-1/16

2-13/32

5-29/32

2-7/8

2-3/4

2-3/4

2-3/4

2-3/4

4-7/16

2-15/16

2-1/32

4-1/2

Unit: inch(mm)

18

# 4. REFRIGERANT FLOW DIAGRAM

## 4-1. Refrigerant Flow Diagram

Outdoor Unit **CLM1972**

**Indoor unit**                                                    **Outdoor unit**

| | |
|---|---|
| Wide tube O.D.3/8" | Service valve on wide tube — CW |
| O.D.3/8" | BW |
| O.D.3/8" | AW — Header |

Sub accumulator   Main accumulator   Compressor

High pressure switch
H.P.

Heat exchanger

| | |
|---|---|
| Narrow tube O.D.1/4" | Service valve on narrow tube — CN — Electric expansion valve |
| O.D.1/4" | BN |
| O.D.1/4" | AN |

Strainer          Header

Cooling cycle
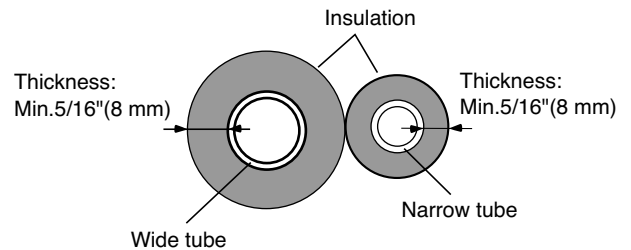
## Insulation of Refrigerant Tubing

**IMPORTANT**

Because capillary tubing is used in the outdoor unit, both the wide and narrow tubes of this air conditioner become cold. To prevent heat loss and wet floors due to dripping of condensation, **both tubes must be well insulated** with a proper insulation material. The thickness of the insulation should be a min.5/16"(8 mm).

⚠ **CAUTION**

**After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.**
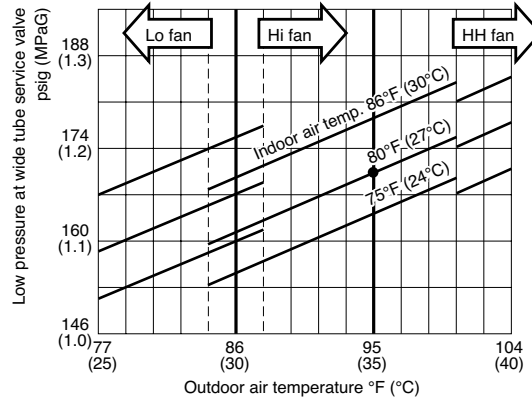
Insulation

Thickness: Min.5/16"(8 mm)

Thickness: Min.5/16"(8 mm)

Wide tube

Narrow tube

**Indoor unit**                                                        **Outdoor unit**

Service valve on
wide tube

Wide tube          DW
O.D.3/8"

                   CW                          Sub          Main
O.D.3/8"                                    accumulator   accumulator    Compressor

                   BW
O.D.3/8"                                                  High pressure
                                                             switch
                   AW                                        H.P.
O.D.1/2"
                   Header

                                                                        Heat exchanger
                              Electric
                              expansion
Service valve on              valve
narrow tube
Narrow tube        DN
O.D.1/4"                        M

                   CN
O.D.1/4"                        M

                   BN
O.D.1/4"                        M

                   AN
O.D.1/4"                        M
                   Strainer   Header

                                                                        Cooling cycle

## Insulation of Refrigerant Tubing

**IMPORTANT**

Because capillary tubing is used in the outdoor unit, both the
wide and narrow tubes of this air conditioner become cold. To
prevent heat loss and wet floors due to dripping of
condensation, **both tubes must be well insulated** with a
proper insulation material. The thickness of the insulation
should be a min.5/16"(8 mm).

Insulation

Thickness:                                          Thickness:
Min.5/16"(8 mm)                                     Min.5/16"(8 mm)

                                                    Narrow tube
                              Wide tube

⚠ **CAUTION**   **After a tube has been insulated,
never try to bend it into a narrow
curve because it can cause the tube
to break or crack.**

**Indoor unit**

**Outdoor unit**

Service valve on wide tube

Wide tube
O.D.3/8"

DW

CW

O.D.3/8"

BW

O.D.1/2"

AW

O.D.1/2"

Header

Sub accumulator

Main accumulator

Compressor

High pressure switch

H.P.

Heat exchanger

Electric expansion valve

Service valve on narrow tube

Narrow tube
O.D.1/4"

DN

O.D.1/4"

CN

O.D.1/4"

BN

O.D.1/4"

AN

Strainer

Header

Cooling cycle

## Insulation of Refrigerant Tubing

**IMPORTANT**

Because capillary tubing is used in the outdoor unit, both the wide and narrow tubes of this air conditioner become cold. To prevent heat loss and wet floors due to dripping of condensation, **both tubes must be well insulated** with a proper insulation material. The thickness of the insulation should be a min.5/16"(8 mm).

⚠ **CAUTION**

**After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.**

Insulation

Thickness:
Min.5/16"(8 mm)

Thickness:
Min.5/16"(8 mm)

Narrow tube

Wide tube

# 5. PERFORMANCE DATA

## 5-1. Temperature Charts

### 5-1-1. Temperature Charts (CLM1972)

Outdoor Unit **CLM1972**   Indoor Unit **KMS0772 × 1**

■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart



(2) Operating current performance chart



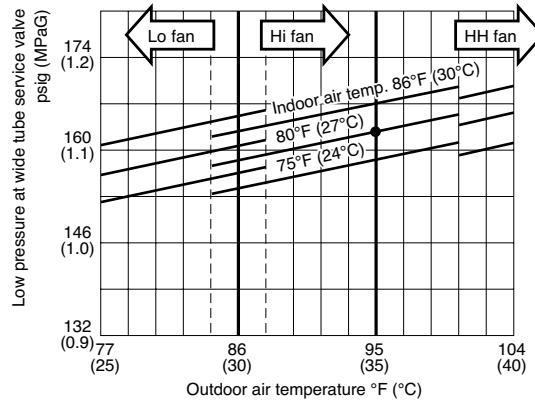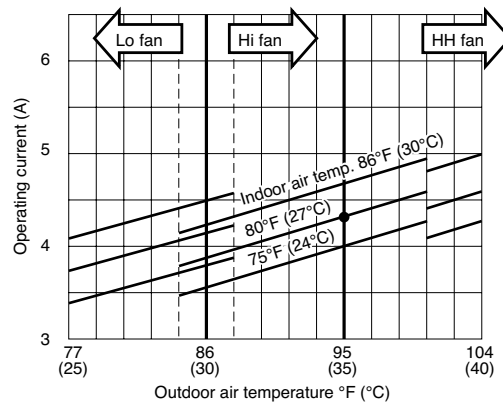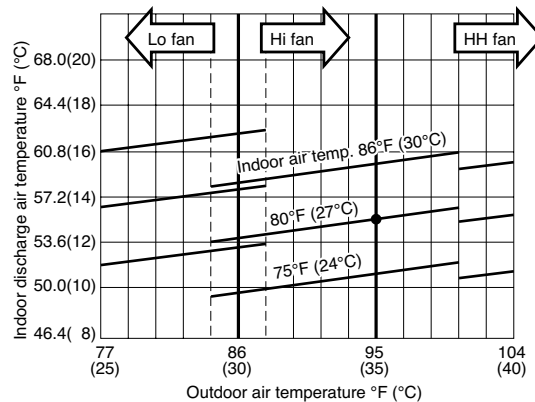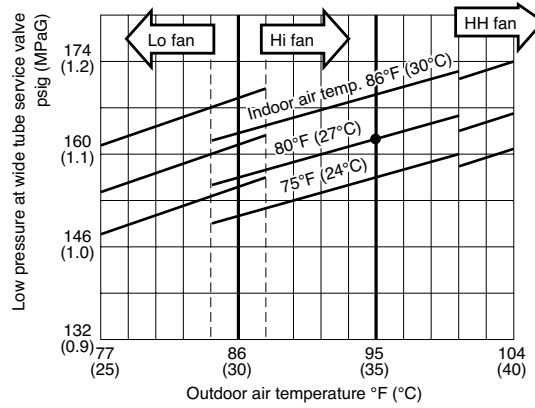(3) Indoor discharge air performance chart



**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6t (7.5m). If the tubing length is different, the performance chart will vary.

22

Outdoor Unit **CLM1972** Indoor Unit **KMS0972 ✕ 1**

■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

**(1) Low pressure performance chart**



**(2) Operating current performance chart**



**(3) Indoor discharge air performance chart**



**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.
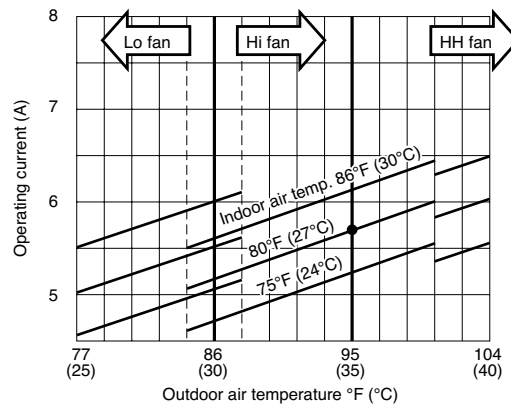
Outdoor Unit **CLM1972**  Indoor Unit  **KMS1272 × 1**

■Cooling Characteristics
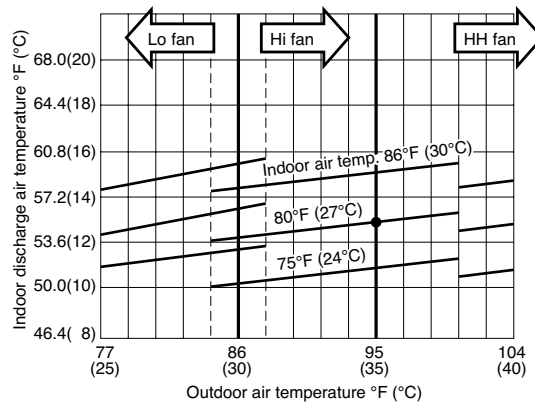(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart

Low pressure at wide tube service valve psig (MPaG)

| | Lo fan | Hi fan | | HH fan |

174 (1.2)
160 (1.1)
146 (1.0)
132 (0.9)

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

Outdoor air temperature °F (°C)
77 (25)  86 (30)  95 (35)  104 (40)

(2) Operating current performance chart

Operating current (A)

| | Lo fan | Hi fan | | HH fan |

6
5
4
3

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

Outdoor air temperature °F (°C)
77 (25)  86 (30)  95 (35)  104 (40)

(3) Indoor discharge air performance chart

Indoor discharge air temperature °F (°C)

| | Lo fan | Hi fan | | HH fan |

68.0(20)
64.4(18)
60.8(16)
57.2(14)
53.6(12)
50.0(10)
46.4( 8)

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

Outdoor air temperature °F (°C)
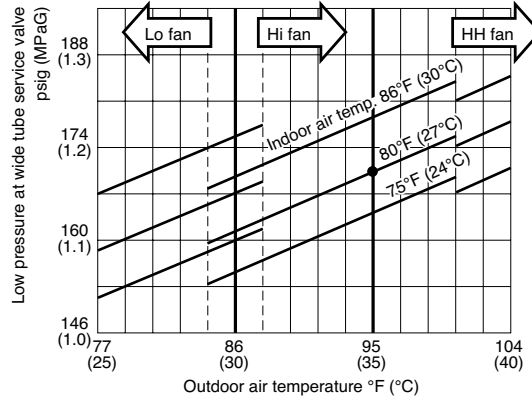77 (25)  86 (30)  95 (35)  104 (40)

**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

**24**
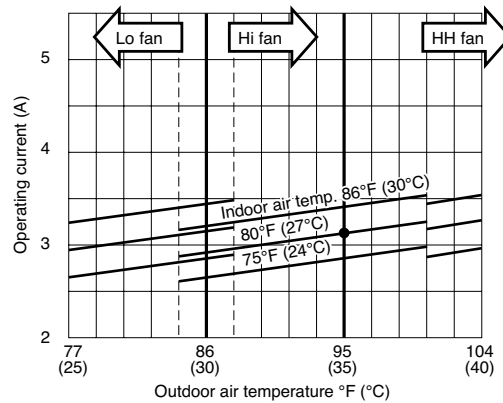
Outdoor Unit  **CLM1972**    Indoor Unit  **KMS1872 × 1**

■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

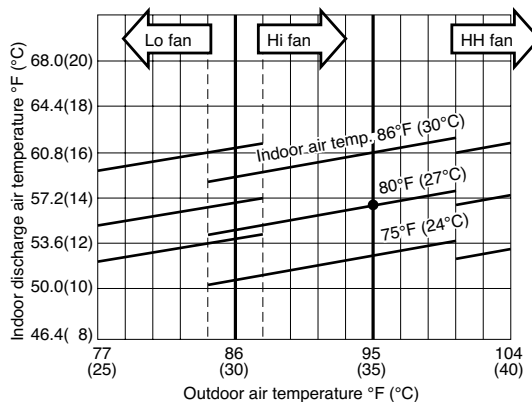(1) Low pressure performance chart

Low pressure at wide tube service valve psig (MPaG)

| | Lo fan | Hi fan | | HH fan |

174 (1.2)

Indoor air temp. 86°F (30°C)

160 (1.1)
80°F (27°C)
75°F (24°C)

146 (1.0)

132 (0.9)

77 (25)     86 (30)     95 (35)     104 (40)

Outdoor air temperature °F (°C)

(2) Operating current performance chart

8

Operating current (A)

| | Lo fan | Hi fan | | HH fan |

7

Indoor air temp. 86°F (30°C)

6
80°F (27°C)
75°F (24°C)

5

77 (25)     86 (30)     95 (35)     104 (40)

Outdoor air temperature °F (°C)

(3) Indoor discharge air performance chart

Indoor discharge air temperature °F (°C)

| | Lo fan | Hi fan | | HH fan |

68.0(20)

64.4(18)

60.8(16)
Indoor air temp. 86°F (30°C)
57.2(14)
80°F (27°C)
53.6(12)
75°F (24°C)
50.0(10)

46.4( 8)

77 (25)     86 (30)     95 (35)     104 (40)

Outdoor air temperature °F (°C)

**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

## 5-1-2.  Temperature Charts (CLM2472)

Outdoor Unit  **CLM2472**  Indoor Unit  **KMS0772** × **1**

■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart



(2) Operating current performance chart



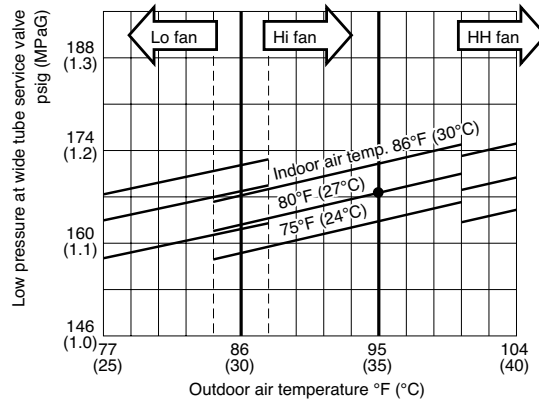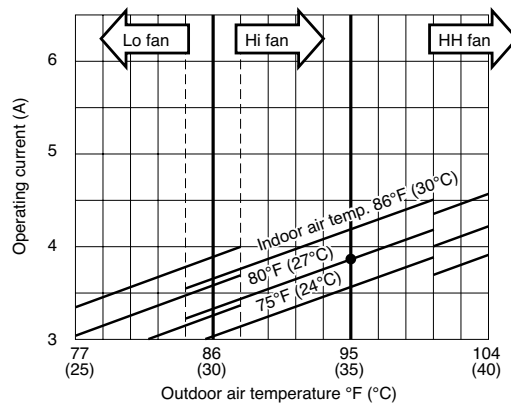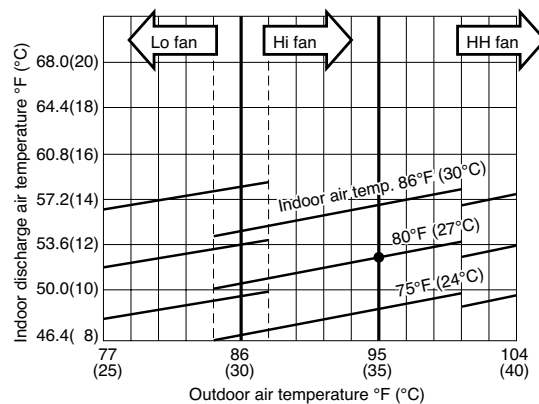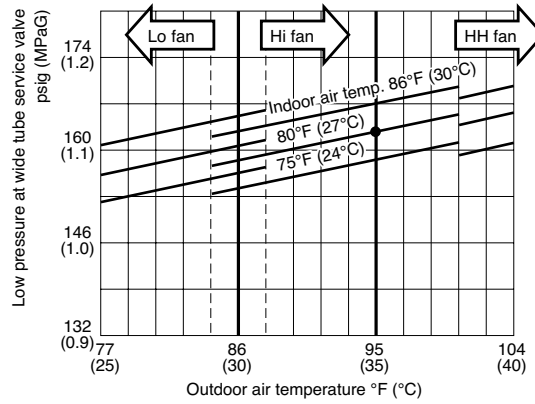(3) Indoor discharge air performance chart



**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6t (7.5m). If the tubing length is different, the performance chart will vary.

26

Outdoor Unit **CLM2472**   Indoor Unit   **KMS0972** ✕ **1**
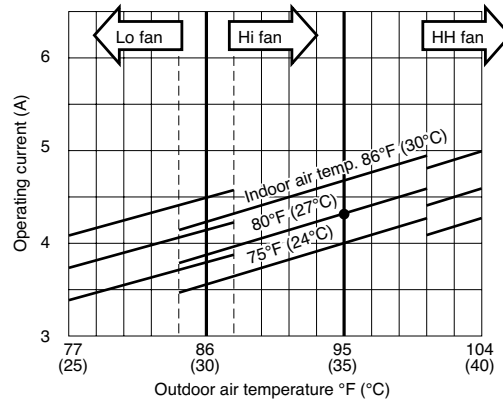
■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

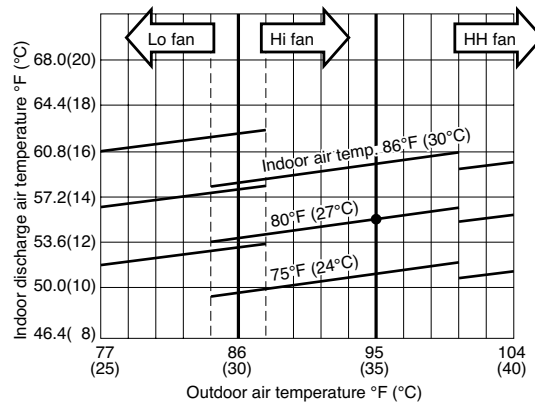(1) Low pressure performance chart



(2) Operating current performance chart



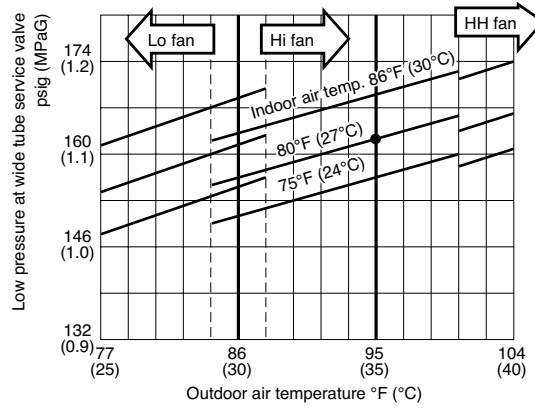(3) Indoor discharge air performance chart



**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.
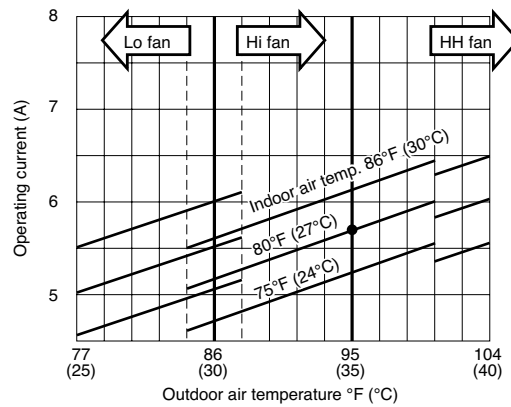
**27**

Outdoor Unit **CLM2472** Indoor Unit **KMS1272 × 1**

■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart

Low pressure at wide tube service valve psig (MPaG)

| | Lo fan | Hi fan | | HH fan |

174 (1.2)

Indoor air temp. 86°F (30°C)

160 (1.1)
80°F (27°C)
75°F (24°C)

146 (1.0)

132 (0.9)

77 (25) — 86 (30) — 95 (35) — 104 (40)

Outdoor air temperature °F (°C)

(2) Operating current performance chart

| Lo fan | Hi fan | | HH fan |

Operating current (A)

6

5
Indoor air temp. 86°F (30°C)

4
80°F (27°C)
75°F (24°C)

3

77 (25) — 86 (30) — 95 (35) — 104 (40)

Outdoor air temperature °F (°C)

(3) Indoor discharge air performance chart

| Lo fan | Hi fan | | HH fan |

Indoor discharge air temperature °F (°C)

68.0(20)

64.4(18)

60.8(16)
Indoor air temp. 86°F (30°C)

57.2(14)

53.6(12)
80°F (27°C)

50.0(10)
75°F (24°C)

46.4( 8)

77 (25) — 86 (30) — 95 (35) — 104 (40)

Outdoor air temperature °F (°C)

**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

Outdoor Unit **CLM2472**    Indoor Unit **KMS1872 × 1**

■Cooling Characteristics
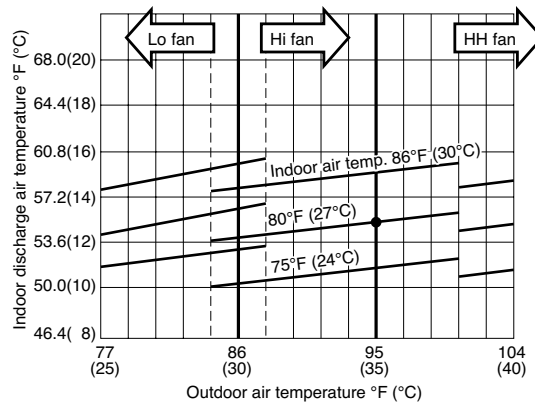(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart



(2) Operating current performance chart



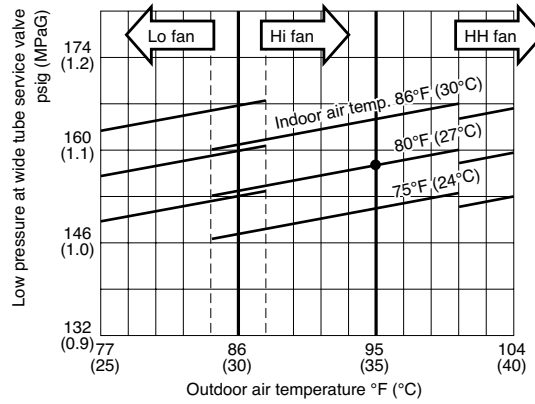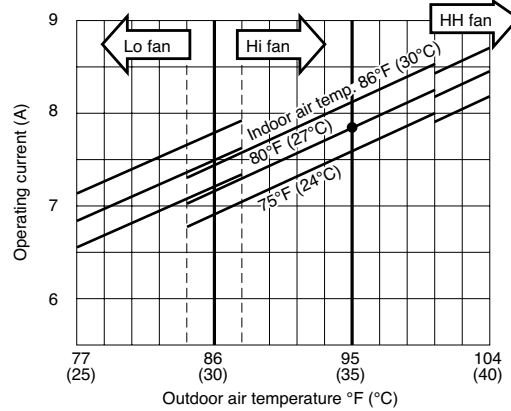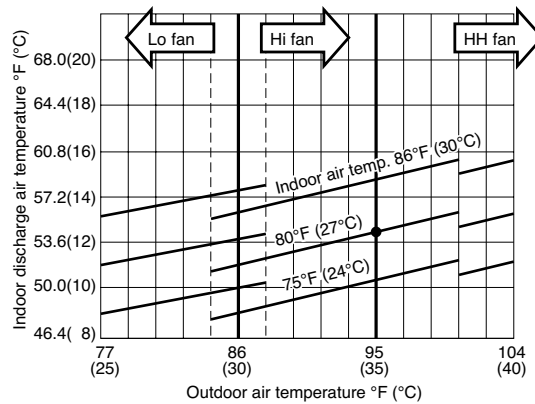(3) Indoor discharge air performance chart



**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

Outdoor Unit **CLM2472**    Indoor Unit **KMS2472** ✕ **1**

■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart

Low pressure at wide tube service valve psig (MPaG)

| | | |
|---|---|---|
| Lo fan | Hi fan | HH fan |

174 (1.2)
160 (1.1)
146 (1.0)
132 (0.9)

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25)  86 (30)  95 (35)  104 (40)
Outdoor air temperature °F (°C)

(2) Operating current performance chart

Operating current (A)

| | | |
|---|---|---|
| Lo fan | Hi fan | HH fan |

9
8
7
6

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25)  86 (30)  95 (35)  104 (40)
Outdoor air temperature °F (°C)

(3) Indoor discharge air performance chart

Indoor discharge air temperature °F (°C)

| | | |
|---|---|---|
| Lo fan | Hi fan | HH fan |

68.0(20)
64.4(18)
60.8(16)
57.2(14)
53.6(12)
50.0(10)
46.4( 8)

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25)  86 (30)  95 (35)  104 (40)
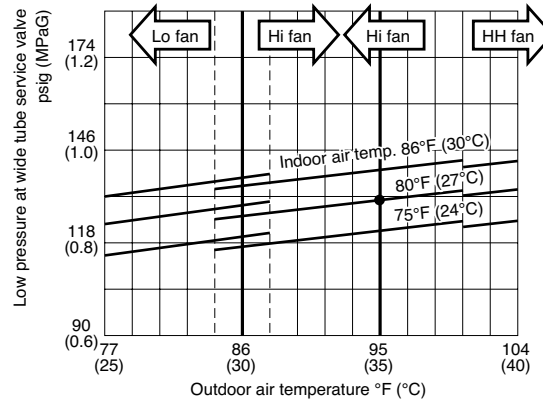Outdoor air temperature °F (°C)

**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

**30**
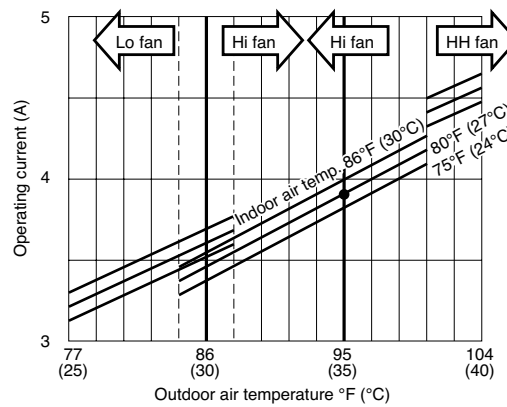
## 5-1-3. Temperature Charts (CLM3172)

Outdoor Unit **CLM3172** Indoor Unit **KMS0772** ✕ **1**

■Cooling Characteristics
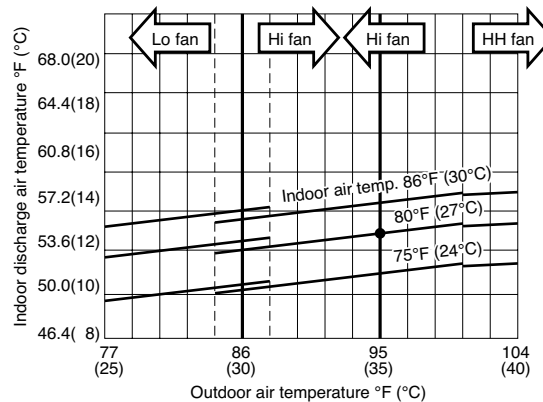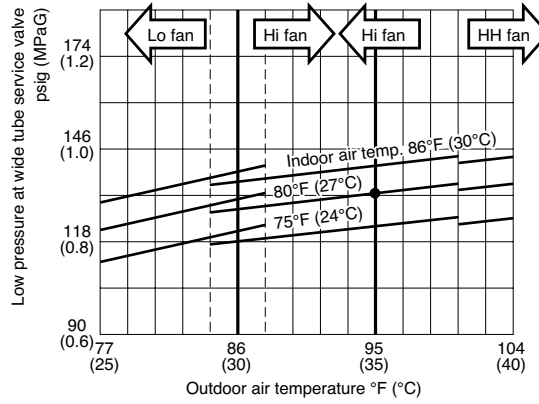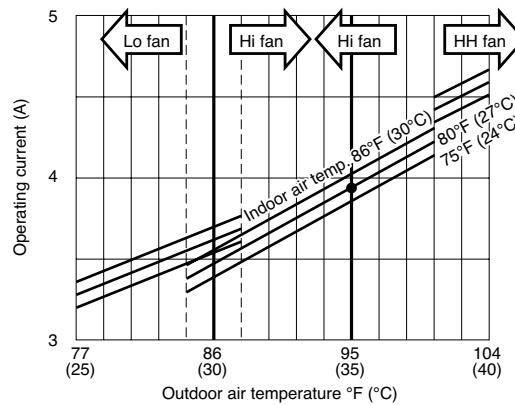(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

### (1) Low pressure performance chart



Low pressure at wide tube service valve psig (MPaG)

Lo fan | Hi fan | Hi fan | HH fan

174 (1.2)
146 (1.0)
118 (0.8)
90 (0.6)

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25) | 86 (30) | 95 (35) | 104 (40)
Outdoor air temperature °F (°C)

### (2) Operating current performance chart



Operating current (A)

Lo fan | Hi fan | Hi fan | HH fan

5
4
3

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25) | 86 (30) | 95 (35) | 104 (40)
Outdoor air temperature °F (°C)

### (3) Indoor discharge air performance chart



Indoor discharge air temperature °F (°C)

Lo fan | Hi fan | Hi fan | HH fan

68.0(20)
64.4(18)
60.8(16)
57.2(14)
53.6(12)
50.0(10)
46.4( 8)

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25) | 86 (30) | 95 (35) | 104 (40)
Outdoor air temperature °F (°C)

**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

Outdoor Unit **CLM3172**   Indoor Unit **KMS0972 × 1**

■Cooling Characteristics
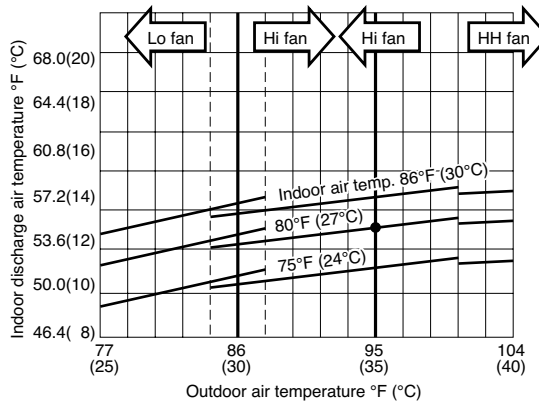(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart



(2) Operating current performance chart
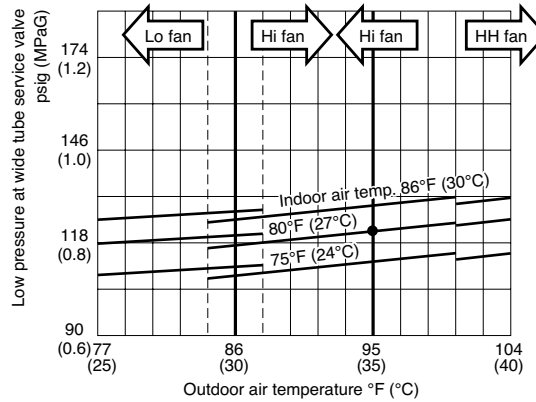


(3) Indoor discharge air performance chart



**NOTE**

・ This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・ Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・ The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.
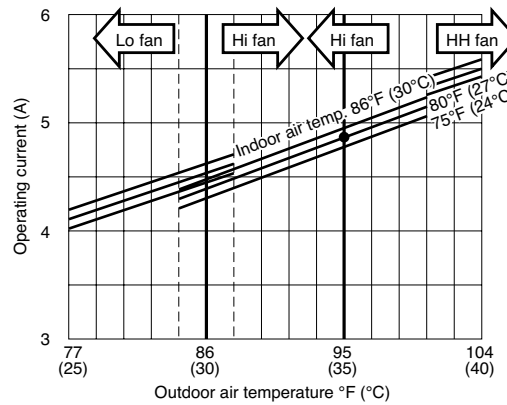
Outdoor Unit **CLM3172**   Indoor Unit   **KMS1272** ✕ **1**

■Cooling Characteristics
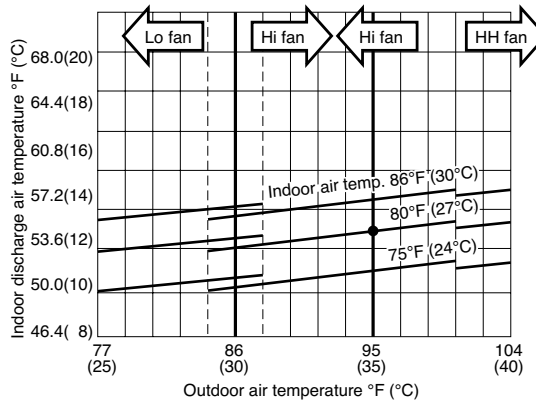(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart



(2) Operating current performance chart



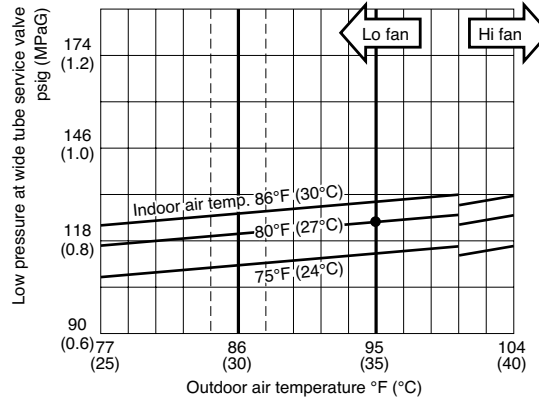(3) Indoor discharge air performance chart



**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.
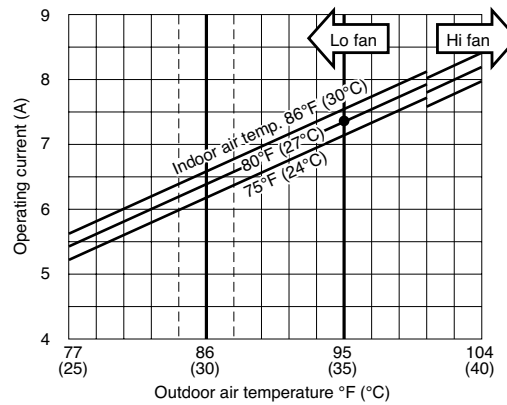
Outdoor Unit **CLM3172** Indoor Unit **KMS1872 × 1**

■Cooling Characteristics
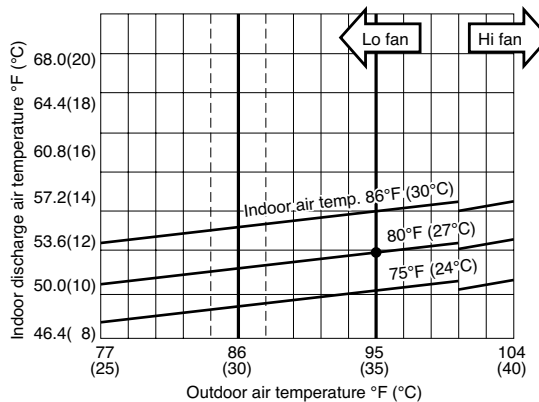(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart

Low pressure at wide tube service valve psig (MPaG)

| | |
|---|---|
| 174 (1.2) | |
| 146 (1.0) | |
| 118 (0.8) | |
| 90 (0.6) | |

Lo fan    Hi fan

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25)    86 (30)    95 (35)    104 (40)
Outdoor air temperature °F (°C)

(2) Operating current performance chart

Operating current (A)

9
8
7
6
5
4

Lo fan    Hi fan

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25)    86 (30)    95 (35)    104 (40)
Outdoor air temperature °F (°C)

(3) Indoor discharge air performance chart

Indoor discharge air temperature °F (°C)

68.0(20)
64.4(18)
60.8(16)
57.2(14)
53.6(12)
50.0(10)
46.4( 8)

Lo fan    Hi fan

Indoor air temp. 86°F (30°C)
80°F (27°C)
75°F (24°C)

77 (25)    86 (30)    95 (35)    104 (40)
Outdoor air temperature °F (°C)

**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

Outdoor Unit **CLM3172** Indoor Unit **KMS2472** ✕ **1**

■Cooling Characteristics
(RH : 46%, Indoor fan speed : High fan)
(230V, 60Hz)

(1) Low pressure performance chart



(2) Operating current performance chart
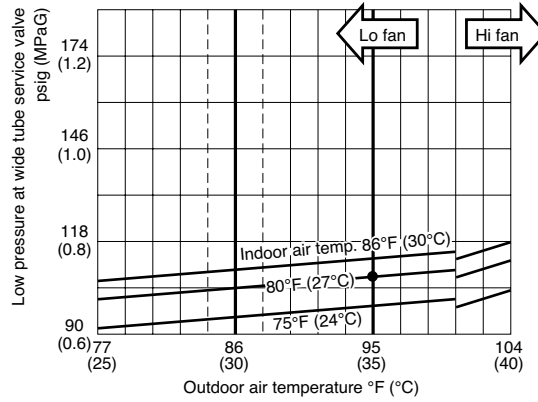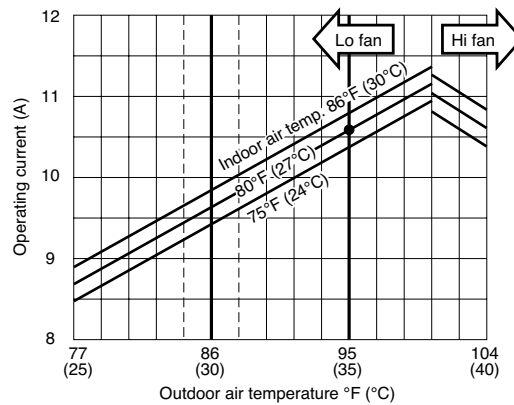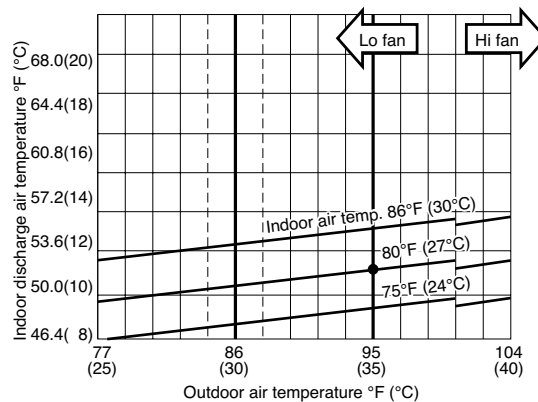


(3) Indoor discharge air performance chart



**NOTE**

・This performance chart shows operation of a single wall-mounted indoor unit. The performance chart will vary depending on the indoor unit type.

・Check each performance value in test-run mode. Electrical performance values represent a combined indoor/outdoor value. (In this case, be sure to stop all the indoor units where performance is not being checked.)

・The performance is for a tubing length of 24.6ft (7.5m). If the tubing length is different, the performance chart will vary.

## 5-2. Heating Performance

This data will be available in next issue of the Technical & Service Manual.
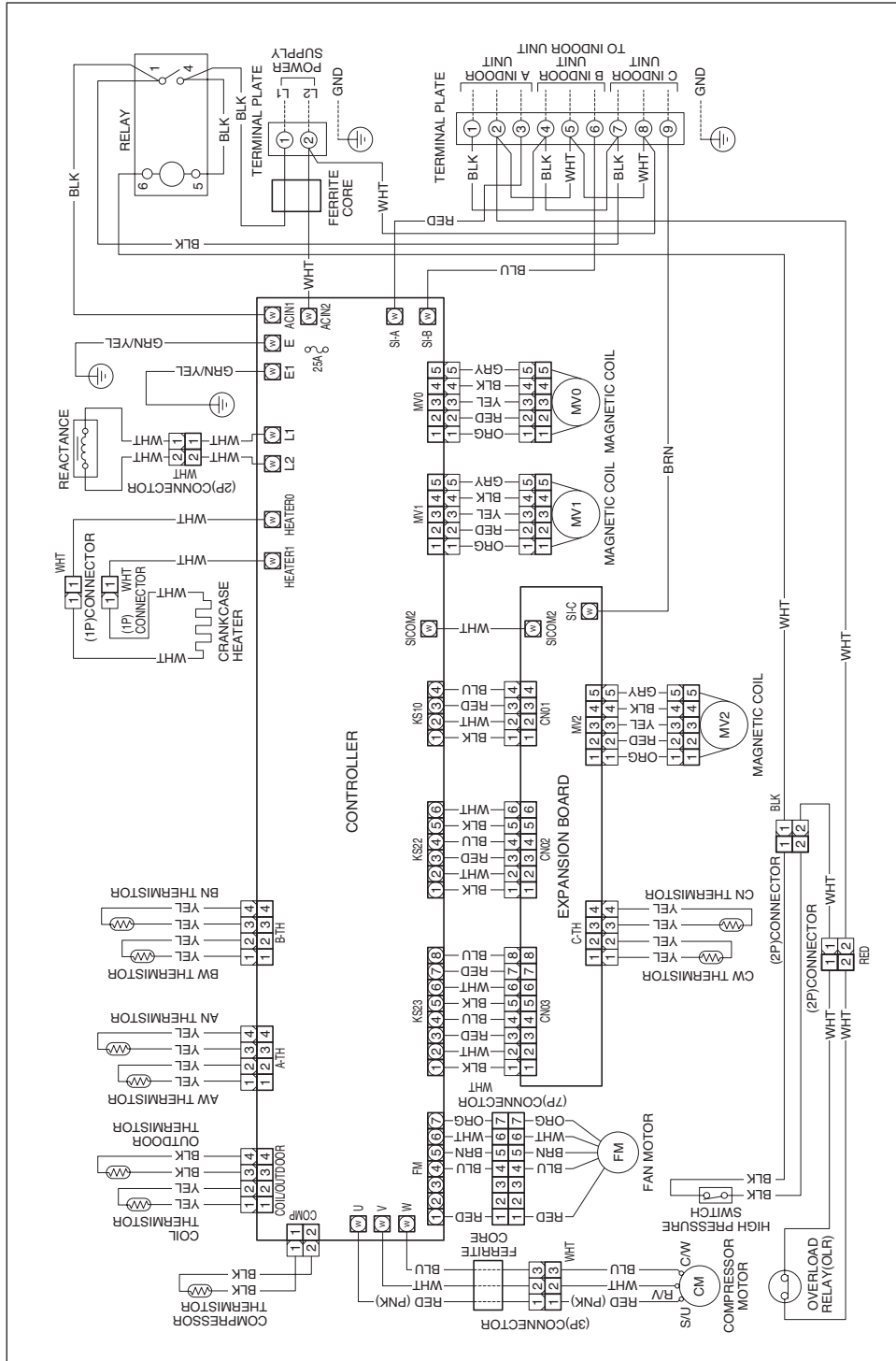
# 6. ELECTRICAL DATA

## 6-1. Electric Wiring Diagrams

Outdoor Unit **CLM1972**



**WARNING** *To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.*

8FA2-5257-59400-1

Outdoor Unit **CLM2472**



WARNING

**To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.**
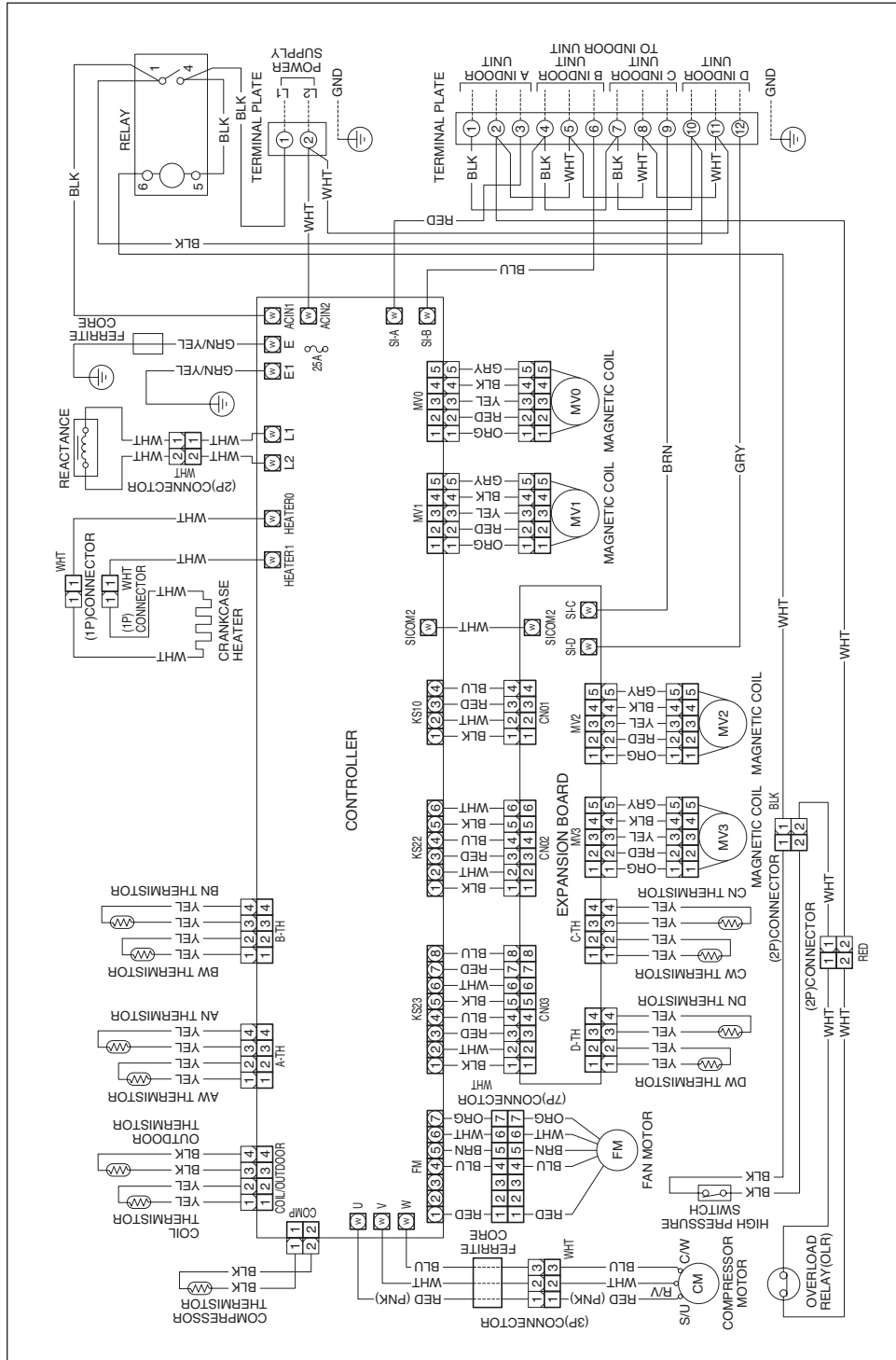


8FA2-5257-59600-1

Outdoor Unit **CLM3172**

8FA2-5257-89500-1

# 7. FUNCTIONS

## 7-1. Explanation of Functions

**NOTE** The numerical values such as temperature, frequency, time and current in parentheses are an example of CLM3172 and the values are different from the other models.

| | Control/conditions | Unit operation | Explanation |
|---|---|---|---|
| **INITIAL** | Breaker is ON. | _____ | Power is supplied to the indoor and outdoor unit control circuits, however the unit remains stopped. Positioning of the outdoor unit electric expansion valve is performed. |
| | The ON/OFF operation button on the remote controller is pressed. | If automatic operation mode has been selected with the remote controller, operation begins in SENSOR DRY, or COOL mode depending on the room temperature and outdoor temperature at the time operation starts. | ● This applies in the case of automatic COOL operation. |
| | | ⬇ Depending on the operational mode, refer to the SENSOR DRY, or COOL item. | |

| | Control/conditions | Unit operation | Explanation |
|---|---|---|---|
| **COOL** | The ON/OFF operation button on the remote controller is pressed. | ● The operation lamp illuminates.<br>● The indoor fan operates at the set fan speed.<br>● The outdoor unit stops. | The outdoor unit does not operate for 3 minutes even after the breaker is turned ON. |
| | | The outdoor unit starts.<br><br>(Compressor and the outdoor fan start.) | ● The frequency is increased at the rate of 0.5 Hz every 1 seconds. |
| | | When the frequency reaches $\alpha$ Hz, frequency increases are stopped for a period of $\beta$ seconds. (Refer to Table 1.) | This is in order to stabilize the return of oil to the compressor. |
| | | The frequency then increases. | If the indoor and outdoor temperatures are high, the current peak cut-off activates, stopping any increases in frequency. |
| | The room temperature has reached the desired temperature. | The indoor temperature and the desired temperature are approximately equal. | Operating frequency is stabilized in order to maintain a comfortable environment. |
| | The thermostat turns OFF. | ———————————— | The outdoor unit stops. (It does not stop if the thermostart for another indoor unit is ON.) |
| | The thermostat turns ON again. | After the thermostat turns ON again, the outdoor unit will not operate for 3 minutes, even if the room temperature increases above the desired temperature. | After 3 minutes, the outdoor unit begins operating automatically.<br>During these 3 minutes, a pressure balance is achieved, allowing the compressor to start more easily. |
| | Freeze prevention | ● When the temperature of the indoor heat exchanger drops to approximately 35.6 °F or below, the compressor turns OFF, the outdoor fan turns OFF, and the indoor fan continues operating with no changes.<br>⇩<br>● Approximately 3 minutes later, if the temperature of the indoor heat exchanger is adove 46.4 °F, the system returns to its original conditions. | In order to protect against freezing, the compressor stops temporarily, until the temperature of the indoor heat exchanger has risen. |
| | Stop | All indicator lamps turn OFF. The indoor and outdoor units stop. | ———————————— |
| | Operation is restarted within 4 hours (only when AUTO mode is selected with the remote controller). | Starts operating in the same operating mode (COOL) and with the same temperature settings as before operation was stopped. | Within 4 hours after operation was stopped, it is assumed that there has been no significant change in the indoor and outdoor temperatures, and the previous conditions (COOL) are stored. |
| | Operation starts after 4 hours or more have passed. | New operating mode is determined based on the temperature conditions at the time the ON/OFF operation button is pressed. | ———————————— |

Frequency control

| $\alpha$ (Hz) | $\beta$ (senconds) | |
|---|---|---|
| | Outdoor air temperature is below 32 °F. | Outdoor air temperature is 32 °F or higher. |
| (25) Hz | (120) seconds | (60) seconds |
| (35) Hz | (60) seconds | (30) seconds |
| (45) Hz | (60) seconds | (30) seconds |
| (55) Hz | (180) seconds | (90) seconds |

**Table 1**

**(1/f fluctuation fan)**

| | Control/conditions | Unit operation | Explanation |
|---|---|---|---|
| **SENSOR DRY** | The ON/OFF operation button on the remote controller is pressed. | ● The operation lamp illuminates.<br>● The indoor fan operates at the set fan speed.<br>● The outdoor unit stops. | The outdoor unit does not operate for 3 minutes even after the breaker is turned ON. |
| | | The outdoor unit starts.<br><br>(Compressor and the outdoor fan start.) | ● The frequency is increased at the rate of 0.5 Hz every 1 seconds. |
| | | When the frequency reaches $\alpha$ Hz, frequency increases are stopped for a period of $\beta$ seconds. (Refer to Table 1.) | This is in order to stabilize the return of oil to the compressor. |
| | | The frequency then increases. | If the indoor and outdoor temperatures are high, the current peak cut-off activates, stopping any increases in frequency. |
| | The room temperature reaches the desired temperature, and there is no need for further cooling. | ● DRY operation starts<br><br>**DRY A operation**<br><br>● The indoor fan changes between "Low" and "LL" (very low) over a 6-minute cycle. This is 1/f fluctuation fan operation. (Refer to Fig. 1.) | Operating frequency is stabilized in order to maintain a comfortable environment.<br><br>● Operates to effectively dehumidify the air while not excessively reducing the indoor temperature.<br>● The indoor unit operates at 1/f fluctuation fan operation, at a fan speed that does not cause a chilly feeling. |
| | The room temperature is 59 °F or higher, and is slightly too cold. | **DRY B operation**<br><br>(1) The indoor fan changes between "Low" and "LL" (very low) over a 6-minute cycle. This is 1/f fluctuation fan operation.<br><br>⇩<br><br>(2) After appoximately 3 minutes, the compressor turns OFF, the outdoor fan turns OFF, and the indoor fan turns OFF.<br><br>⇩<br><br>(3) After approximately 6 minutes, the conditions return to (1). | The compressor operates on a 3-minutes ON, 6-minutes OFF cycle, to prevent the room temperature from dropping too much. |
| | The room temperature is below 59 °F. | ● Monitoring operation begins. | When monitoring operation begins, the compressor stops, and the indoor fan operates at "LL" (very low) speed. |

**● 1/f fluctuation fan**



**Fig. 1**

42

## < Low Ambient Cooling Operation >

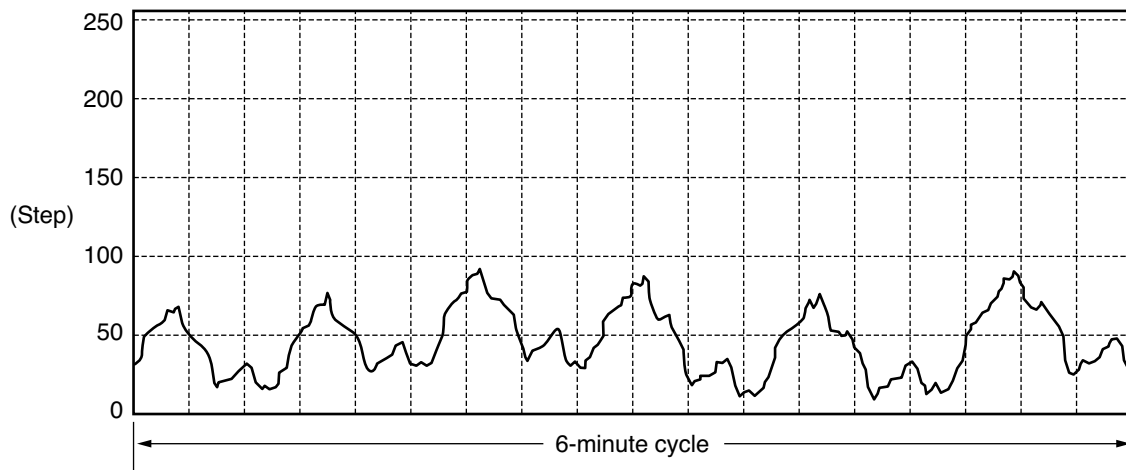**NOTE** The following descriptions of low ambient cooling operation are applied only to
CLM1972 and CLM2472

● When the outdoor air temperature reaches 57.2 °F (14 °C ) or less during the cooling operation,
the operation mode is switched to low ambient cooling operation.
● When the mode is switched from cooling opration to low ambient cooling operation,
the compressor is stopped for 150 seconds temporarily.
● When the mode has been switched to low ambient cooling operation,
the outdoor fan speed is lowered as the outdoor air temperature falls.



32 °F ( °C )
Outdoor air temperature
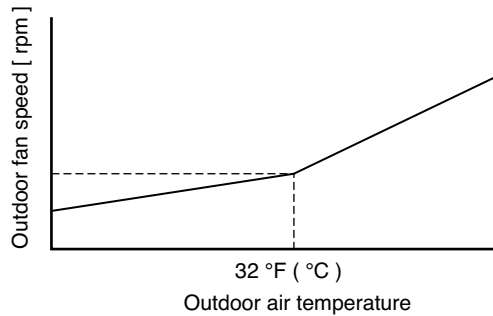
● When the outdoor air temperature reaches 62.6 °F (17 °C ) or more during the low ambient
cooling operation, the operation mode is switched to cooling operation.
● The following protective actions are available to prevent the compressor from operating
with abnormal loads.
At that time, they initiate thermo-off ( stopping the outdoor unit ) of the air conditioner.

Indoor unit : KMS0772
KMS0972
KMS1272
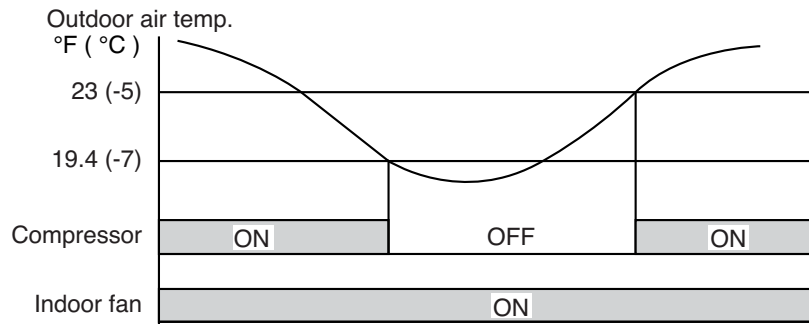


Indoor unit : KMS1872
KMS2472



43
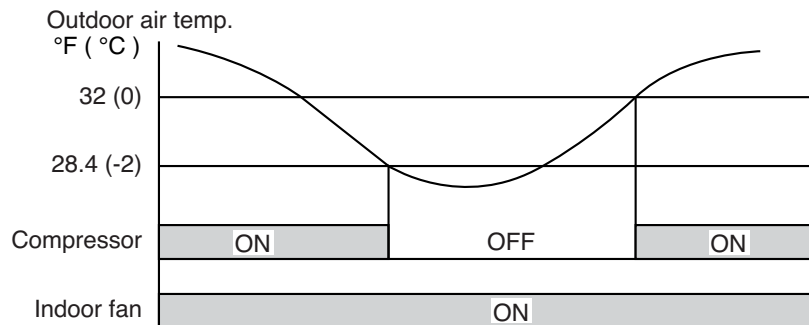
# 7-2. Protective Functions

The numerical values such as temperature, frequency, time and current in parentheses are an example of CLM3172 and the values are different from the other models.

## 7-2-1. Current Control

● The operating current may rise as a result of causes including increasing cooling loads or decreases in power voltage. In these cases, the operating frequency is automatically reduced, or operation is stopped, in order to control the operating current so that it is (20 A) or less.

As a result:

・ Power breakers and fuses will not be tripped.

・ Operation can continue during this period with somewhat reduced cooling capacity.

・ Operation at normal capacity is restored when the cause of the current rise is eliminated.

### Description of function



Example of operation for cooling
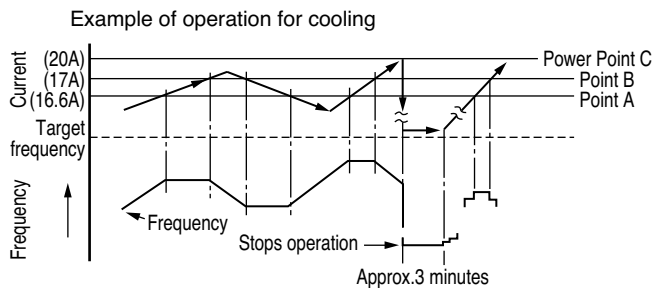
・Operates at the target frequency at Point A and below.
・Stops increases to the frequency between Points A and B.
・Reduces the frequency by 1 Hz per 0.5 seconds when Point B is exceeded.
・Stops operation, and restarts it appoximately 3 minutes later, if Point C is exceeded.
　(May operate when sudden voltage fluctuations occur. → Indicates trouble.)

### (1) Automatic frequency control

The operating frequency is reduced automatically, or operation is stopped, in order to control the operating current so that it is at or below the values shown in the table below.

| | (20A) |
| --- | --- |
| | COOL |
| Point C (peak cut trip) | (20.0) |
| Point B (Hz reduction) | (17.0) |
| Point A (Hz increase prohibit) | (16.6) |

**(2) Current control**

The operating frequency upper limits shown in the figure below are established for frequency reduction and increase-prohibit.



Current(A)　　Example of operation during cooling
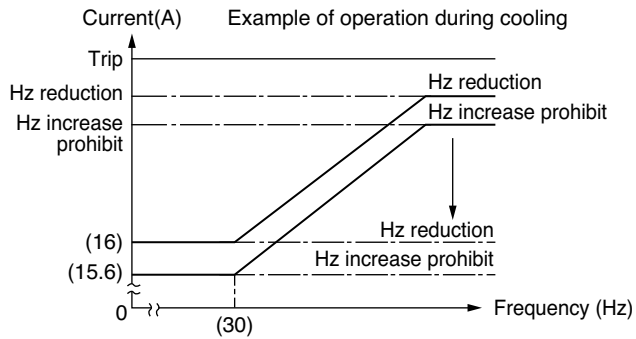
## 7-2-2.  Low Start Current

Operation starts at (8 Hz), and the start current is less than the normal operating  current. This prevents the flickering of fluorescent lights or television screens that occurs when ordinary A/C units start.

## 7-2-3.  Compressor Temperature Control

To protect the compressor coil from overheating, the operating frequency is controlled based on the compressor discharge temperature.
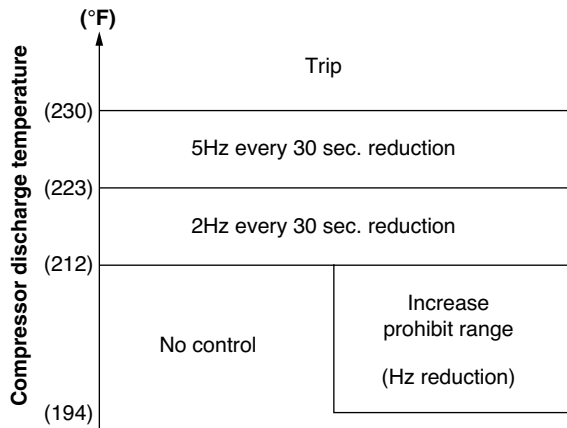


\*  Within the increase-prohibit range, the range changes
　 to the Hz reduction range (2 Hz every 30 seconds) if
　 the compressor temperature rises by 4 °F.

# 8.  TROUBLESHOOTING

## 8-1.  Precautions before Performing Inspection or Repair

■ **Both the indoor unit and outdoor unit include electronic control circuits.**
**Be sure to pay attention to the following before inspecting or repairing the outdoor-side electronic circuits.**

● High-capacity electrolytic capacitors are used inside the outdoor unit controller (inverter). They retain an electrical charge (charging voltage DC 311 V) even after the power is turned OFF, and some time is required for the charge to dissipate.

Be careful not to touch any electrified parts before the control circuit board Power Lamp (red) turns OFF.

If the outdoor control circuit board is normal, approximately 180 seconds will be required for the charge to dissipate. However, allow at least 30 minutes for the charge to dissipate if it is thought there might be trouble with the outdoor control circuit board.

For example, if the outdoor control circuit board fuse has blown, approximately 30 minutes will be required to discharge the high-capacity electrolytic capacitors.

## 8-2. Trouble Diagnosis by Error Monitor Lamps

### 8-2-1. Location of the Error Monitor Lamps

Remove the top plate of outdoor unit and the cover of Electrical Component Box.
The Power Lamp and Error Monitor Lamps are located on the P.C.Board of Electrical Component Box. (Fig.1)



Fig.1 View from top
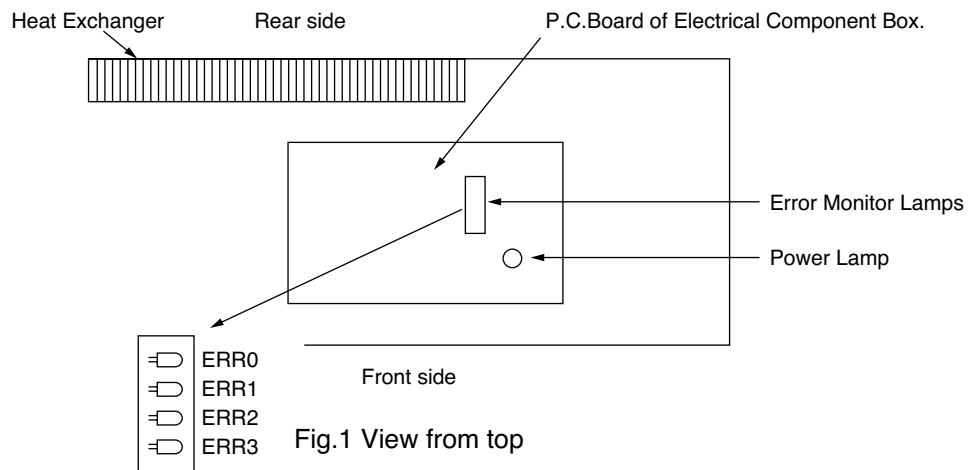
### 8-2-2. Display of the Error Monitor Lamps

If a protective device has activated or there is a sensor failure in the outdoor unit, the 4 error monitor lamps on the outdoor control circuit board will indicate the nature of the trouble.

○ : ON   × : OFF

| Error Monitor Lamp | | | | Error Contents |
|---|---|---|---|---|
| ERR0 | ERR1 | ERR2 | ERR3 | |
| ○ | × | × | ○ | Sensor for compressor discharge temp |
| × | ○ | × | ○ | Sensor for heat exchange temp |
| ○ | × | × | × | Sensor for branch pipe A (Narrow tube) |
| × | ○ | × | × | Sensor for branch pipe B (Narrow tube) |
| ○ | ○ | × | × | Sensor for branch pipe C (Narrow tube) |
| × | × | ○ | × | Sensor for branch pipe D (Narrow tube) |
| ○ | ○ | × | ○ | Outdoor temp sensor |
| ○ | × | ○ | × | Sensor for branch pipe A (Wide tube) |
| × | ○ | ○ | × | Sensor for branch pipe B (Wide tube) |
| ○ | ○ | ○ | × | Sensor for branch pipe C (Wide tube) |
| × | × | × | ○ | Sensor for branch pipe D (Wide tube) |
| × | × | ○ | ○ | HIC circuit trouble (current, temp) |
| × | ○ | ○ | ○ | Actuation of comp over load relay |
| ○ | × | ○ | ○ | Actuation of freeze protection function |
| ○ | ○ | ○ | ○ | Outdoor unit error. Detail of error message indicate on indoor LED |

## 8-3. Checking the Outdoor System

### 8-3-1. Checking the outdoor unit

| No. | Work procedure | Check items (unit operation) |
|---|---|---|
| 1 | • Apply 220 V AC between terminals L1 and L2 on the outdoor unit terminal plate. | • The LED (red) on the control board must illuminate. |
| 2 | • Short-circuit the T-RUN terminal to the COM terminal of TEST/T-RUN terminals. | • The compressor and fan motor must turn ON. (They turn ON about (70) seconds later after the power is turned ON.) |

**NOTE** If the above check items are okay, but the outdoor unit does not operate, there may be a faulty connection between the indoor unit and the outdoor unit.

# 8-4. Trouble Diagnosis of Each Part

## 8-4-1. Problems of Each Part and Inspection Points

● For details about the inspection points, refer to the Inspection Points for Each Part.

| Inspection points \ Problems | Indoor unit | | | | Outdoor unit | | | | | | Others | No. of Inspection Points for Each part |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Indoor unit does not operate. | Operation lamp blinking. | Operation lamp does not illuminate. | Indoor fan dose not turn. | Outdoor unit does not operate. | Outdoor fan dose not turn. | The compressor (only) does not operate. | The compressor stops on occasion. | The compressor speed does not increase. | The electric expansion valve does not operate. | Does not cool or cooling performance is inadequate. | |
| Self-Diagnostics check | | ○ | | ○ | ○ | ○ | ○ | | | | | |
| Indoor unit — Indoor controller (control unit) | ○ | ○ | ○ | ○ | ○ | | | | | | | |
| Indoor unit — Indoor fan motor | | ○ | | ○ | | | | | | | | |
| Indoor unit — Room temperature sensor | | ○ | | | | | | | | | | |
| Indoor unit — Heat exchanger temperature sensor | | ○ | | ○ | | | | | | | | |
| Indoor unit — Inter-unit cable | | ○ | | | ○ | ○ | ○ | ○ | ○ | | | |
| Indoor unit — Switch circuit board | ○ | | ○ | | | | | | | | | |
| Outdoor unit — Outdoor control circuit board | | ○ | | | ○ | ○ | ○ | ○ | ○ | | | (1) |
| Outdoor unit — Diode module | | ○ | | | ○ | | | | | | | |
| Outdoor unit — HIC | | ○ | | | ○ | | | | | | | |
| Outdoor unit — Electrolytic capacitor | | ○ | | | ○ | | | | | | | |
| Outdoor unit — Fuse | | ○ | | | ○ | | | | | | | (2) |
| Outdoor unit — Compressor | | ○ | | | ○ | ○ | ○ | ○ | ○ | | | (3) |
| Outdoor unit — Compressor protective sensor | | ○ | | | ○ | | | ○ | ○ | | | (4) |
| Outdoor unit — Outdoor fan motor | | ○ | | | ○ | ○ | | | ○ | | | |
| Outdoor unit — Coil thermistor | | ○ | | | ○ | | | | | | | (5) |
| Outdoor unit — Electric expansion valve | | | | | | | | | | ○ | ○ | (6) |
| Outdoor unit — Branch tubing temperature sensor | | ○ | | | | | | | | | | (7) |

| | | Indoor unit | | | | Outdoor unit | | | | | | Others | No. of Inspection Points for Each part |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Problems / Inspection points | Indoor unit does not operate. | Operation lamp blinking. | Operation lamp does not illuminate. | Indoor fan dose not turn. | Outdoor unit does not operate. | Outdoor fan dose not turn. | The compressor (only) does not operate. | The compressor stops on occasion. | The compressor speed does not increase. | The electric expansion valve does not operate. | Does not cool or cooling performance is inadequate. | |
| Others | Breaker | ○ | | | | ○ | | | | | | | (8) |
| | Refrigerant gas pressure | | | | | | | | ○ | | | ○ | (9) |

## 8-4-2. Inspection Points for Each Part

**(1) Outdoor control circuit board**

Refer to 8-3-1. Checking the outdoor unit.

**NOTE** Do not remove or insert the outdoor control circuit board connector when power is being supplied to it. (The controller will be damaged.)

**(2) Fuse**

Check it visually or the continuity with a tester.

**(3) Compressor**

Check for an open circuit in the compressor coil winding.

**(4) Compressor protective sensor (compressor discharge temperature thermistor)**

Check that the senseor is securely contained in the thermostart holder.

**(5) Coil thermistor**

Check that the sensor is securely contained in the thermostat holder.

## (6) Electric expansion valve

● When replacing the electric expansion valve and coil, be sure to attach the connectors in the correct positions. Labels are applied to the valve body and coil, corresponding to the connector colors, to identify them.

Controller check

No voltage on circuit board          Voltage varies

Use a multi-meter to measure the voltage (12 V).
● When the power is turned ON, the needle will move in the following sequence in approximately 10 to 20 seconds for each point.

| Model No. | Sequence |
|-----------|----------|
| CLM1972 | MV0 → MV1 → MV2 |
| CLM2472 CLM3172 | MV0 → MV1 → MV2 → MV3 |

Check the illumination of the red Power Lamp.

↓

Replace the controller.

Check the coil resistance.

0 ohm          Approx. 46 +/– 4 ohm

Check the resistance between the gray lead wire and the other wires.
Resistance is OK if it is 46 + / – 4ohm at 68 °F

**NOTE**
● Cool the main unit with a damp cloth or other means while welding.
● When applying vacuum, use the special service magnet and rotate at least 5 revolutions counterclockwise to fully open the electric expansion valve.

Replace the coil.

*1
Open and close the electric expansion valve by hand to check it.

No temperature change          Temperature changes

Replace the electric expansion valve.

This part is normal. Check elsewhere.

Use the special service magnet and rotate 5 revolutions clockwise to fully close the valve.
Then start the unit and measure the temperature at the inlet and outlet tubes of the electric expansion valve. If the temperature difference is large, the valve is closed.
Then rotate 5 revolutions counterclockwise to open the valve. Operation is normal if the temperature difference between the 2 tubes drops.

*1 If you have manually checked the electric expansion valve, be sure to reapply the outdoor power after you have replaced the wiring. (The position of the elecric expansion valve will changed.)

**(7) Branch tubing temperature sensor**

Check that the sensor is securely contained in the thermostat holder.

**(8) Breaker**

Check whether or not the breaker has been tripped.

● Check that the breakers and fuses used are of the specified capacity.

● Check that the breaker and its line are exclusive for A/C use.

**(9) Refrigerant gas pressure**

Start a COOL test run, and messure the temperatures of the A/C intake air and discharge air. Compare the values with the performance charts.

● If the values are higher than the performance charts:

Check for refrigerant shortage or blockage of the refrigerant circuit.

< Assessment of refrigerant shortage >

1. The pressure in the low-pressure section is 5 MPa or more below the value in the performance charts.

2. There is little condensation on the indoor heart exchanger, which overall appears dry.

< Distinguishing between refrigerant shortage and refrigerant circuit blockage >

If the pressure in the low-pressure section does not change when the circuit is charged 2 to 3 times with

refrigerant gas (0.44 lbs each time), or if the change is small, then the problem may not be

refrigerant shortage.

The problem may be a blockage of the refrigerant circuit.

1. Check that there is no internal leakage inside the 4-way valve:

At the low-pressure side tubing, check that there is no temperature difference between the intake and

discharge of the 4-way valve.

2. Check that the electric expansion valve is not blocked. Check as described on the preceding page.

## 8-5. Trouble Diagnosis of Fan Motor

● This outdoor DC fan motor contains an internal control PCB. Therefore, it is not possible to measure the coil resistance, and the following procedure should be used to check the motor.
● Perform the trouble diagnosis by Test Run mode described on Installation Instructions of indoor unit.

**Important:** (A) Turn OFF the power before connecting or disconnecting the motor connectors.
(B) When performing voltage measurement at the outdoor controller connector for (3) in the table below, the DC motor will trip and voltage output will stop approximately 10 seconds after operation is started. For this reason, to measure the voltage again, first turn OFF the outdoor unit power, then, measure the voltage in Test Run mode.

**[Trouble symptom 1]**   The fan does not stop when the outdoor unit stops. ➞ Outdoor unit controller trouble

**[Trouble symptom 2]**   The fan motor does not rotate when the outdoor unit is operating.
**(Diagnostic procedure)**
  * Disconnect the motor connectors and measure the voltage at the DC motor connectors on the outdoor unit controller (3 locations).

| Measurement location | Normal value |
|---|---|
| (1) Vm-Gnd: Between pin 1 and pin 4 | DC 230V or more |
| (2) Vcc-Gnd: Between pin 5 and pin 4 | DC 14V or more |
| (3) Vsp-Gnd: Between pin 7 and pin 4 | After fluctuating 4 times between DC 1.7 to 6.1V (1 sec. ON) and DC 0 V (1 sec. OFF), the DC motor trips. |

**(Diagnostic results)**
  All of the above measured values are normal. ➞ Fan motor trouble (Replace the motor.)
  Any one of the above measured values is not normal. ➞ Outdoor unit controller trouble
  (Replace the controller .)

**(Reference)**        DC motor connector pin arrangement

  Pin 1: Vm (red)
  Pin 2: Not used
  Pin 3: Not used
  Pin 4: Gnd (blue)
  Pin 5: Vcc (brown)
  Pin 6: PG (white)
  Pin 7: Vsp (orange)

**[Trouble symptom 3]**   Motor rotates for some time (several seconds), but then quickly stops, when the outdoor unit operates.
  (There is trouble in the system that provides feedback of motor rotation speed from the motor to the outdoor unit controller.)
**[Trouble symptom 4]**   Fan motor rotation speed does not change during outdoor unit operation.
**[Trouble symptom 5]**   Fan motor rotation speed varies excessively during outdoor unit operation.

**(Remedy for symptom 3 to 5)**
  It is not possible to identify whether the trouble is outdoor unit controller trouble or motor trouble.
  Therefore, first replace the outdoor unit controller, then (if necessary) replace the DC motor.

# 9. REFRIGERANT R410A: SPECIAL PRECAUTIONS WHEN SERVICING UNIT

## 9-1. Characteristics of New Refrigerant R410A

### 9-1-1. What is New Refrigerant R410A?

R410A is a new refrigerant that contains two types of pseudo-non-azeotropic refrigerant mixture. Its refrigeration capacity and energy efficiency are about the same level as the conventional refrigerant, R22.

### 9-1-2. Components (mixing proportions)

HFC32 (50%) / HFC125 (50%)

### 9-1-3. Characteristics

● Less toxic, more chemically stable refrigerant

● The composition of refrigerant R410A changes whether it is in a gaseous phase or liquid phase. Thus, when there is a refrigerant leak the basic performance of the air conditioner may be degraded because of a change in composition of the remaining refrigerant. ***Therefore, do not add new refrigerant.*** Instead, recover the remaining refrigerant with the refrigerant recovery unit. Then, after evacuation, totally recharge the specified amount of refrigerant with the new refrigerant at its normal mixed composition state (in liquid phase).

● When refrigerant R410A is used, the composition will differ depending on whether it is in gaseous or liquid phase, and the basic performance of the air conditioner will be degraded if it is charged while the refrigerant is in gaseous state. ***Thus, always charge the refrigerant while it is in liquid phase.***

| ⚠ | CAUTION | Ether-type oil is used for compressor oil for R410A-type units, which is different from the mineral oil used for R22. Thus more attention to moisture prevention and faster replacement work compared with conventional models are required. |
|---|---------|---|

## 9-2.  Checklist before Servicing

Use a clutch-type flare tool for R410A or the conventional flare tool. Note that sizes of the resultant flares differ between these two tools. Where a conventional flare tool is used, make sure to observe A Specification (amount of extrusion) by using the flare spacer.

| Diameter of tube D | Specification A | |
| --- | --- | --- |
| | Flare tool for R410A | Conventional flare tool (for R22) |
| Dia.1/4" (6.35 mm) | 0 to 0.0196"<br>(0 to 0.5 mm) | 0.0472"<br>(1.2 mm) |
| Dia.3/8" (9.52 mm) | | |
| Dia.1/2" (12.7 mm) | | |
| Dia.5/8" (15.88 mm) | | |

● **Size of flare**



Flare tool for R410A          Conventional flare tool (R22)
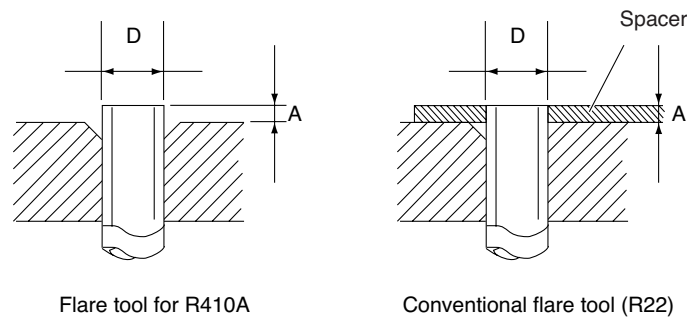
● **Tubing precautions**

● Refrigerant R410A is more easily affected by dust or moisture compared with R22, thus be sure to temporarily cover the ends of the tubing with caps or tape prior to installation.

Never use 0.0276" (0.7 mm)-thick copper tubing or tubing which is less than 0.0315" (0.8 mm) in thickness, since air conditioners with R410A are subject to higher pressure than those using R22 and R407C.

● **No addition of compressor oil for R410A**

No additional charge of compressor oil is permitted.

● **No use of refrigerant other than R410A**

Never use a refrigerant other than R410A.

● **If refrigerant R410A is exposed to fire**

Through welding, etc., toxic gas may be released when R410A refrigerant is exposed to fire. Therefore, be sure to provide ample ventilation during installation work.

● **Caution in case of R410A leak**

Check for possible leak points with the special leak detector for R410A. If a leak occurs inside the room, immediately provide thorough ventilation.

## 9-3. Tools Specifically for R410A

● **For servicing, use the following tools for R410A**

| Tool Distinction | Tool Name |
|---|---|
| Tools specifically for R410A | ● Gauge manifold<br>● Charging hose<br>● Gas leak detector<br>● Refrigerant cylinder<br>● Charging cylinder<br>● Refrigerant recovery unit<br>● Vacuum pump with anti-reverse flow (*1)<br>  (Solenoid valve-installed type, which prevents oil from flowing back into the unit when the power is off, is recommended.)<br>● Vacuum pump (*2)...can be used if the following adapter is attached.<br>● Vacuum pump adapter (reverse-flow prevention adapter) (*3).<br>  (Solenoid valve-installed adapter attached to a conventional vacuum pump.)<br>● Electronic scale for charging refrigerant<br>● Flare tool |
| Tools which can be commonly used for R22, R407C, and R410A | ● Bender<br>● Torque wrench<br>● Cutter, reamer<br>● Welding tool, nitrogen gas cylinder |

⚠ **CAUTION**
- **The above tools specifically for R410A must not be used for R22 and R407C. Doing so will cause malfunction of the unit.**

- **For the above vacuum pump (*1, *2) and vacuum pump adapter (*3), those for R22-type units can be used for R410A-type. However, they must be used exclusively for R410A and never alternately with R22 and R407C.**

● To prevent other refrigerants (R22, R407C) from being mistakenly charged to this unit, shape and external diameter of the service port screw has been altered.
  <External diameter of service port>   R410A : 5/16"
                                         R22, R407C : 1/4"

## 9-4. Tubing Installation Procedures

When the tubes are connected, *always apply HAB oil on the flare portions to improve the sealing of tubing.*
The following is the **HAB oil** generally used:
Esso:  ZERICE S32

**NOTE**  For details on tubing installation procedures, refer to the installation manuals attached to the indoor unit and outdoor unit.

## 9-5. In Case of Compressor Malfunction

⚠️ **CAUTION**
- Should the compressor malfunction, be sure to make the switch to a replacement compressor as quickly as possible.
- Use only the tools indicated exclusively for R410A. → See "9-3. Tools Specifically for R410A."

### 9-5-1. Procedure for Replacing Compressor

**(1) Recovering refrigerant**

- Any remaining refrigerant inside the unit should not be released to the atmosphere, but recovered using the refrigerant recovery unit for R410A.
- Do not reuse the recovered refrigerant, since it will contain impurities.
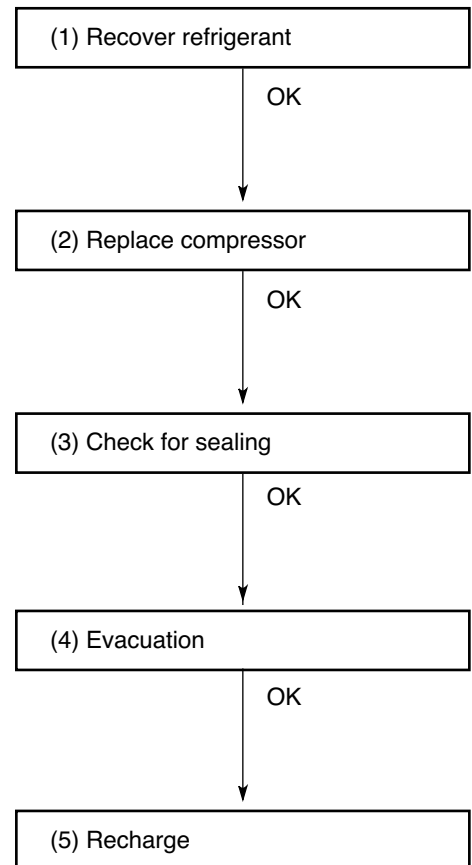
**(2) Replacing Compressor**

- Soon after removing seals of both discharge and suction tubes of the new compressor, replace it quickly.

**(3) Checking for sealing**

- Use nitrogen gas for the pressurized gas, and never use a refrigerant other than R410A. Also do not use oxygen or any flammable gas.

**(4) Evacuation**

- *Use a solenoid valve-installed vacuum pump* so that even if power is cut off in the middle of evacuation of air due to a power interruption, the valve will prevent the pump oil from flowing back.
- The equipment may be damaged if moisture remains in the tubing, thus carry out the evacuation thoroughly.
- When using a vacuum pump with exhaust air volume more than 0.883 cu.ft./min. and ultimate vacuum pressure rate of 50 micron Hg.

```
(1) Recover refrigerant
        | OK
        ↓
(2) Replace compressor
        | OK
        ↓
(3) Check for sealing
        | OK
        ↓
(4) Evacuation
        | OK
        ↓
(5) Recharge
```

**Standard time for evacuation**

| Length of tubing | Less than 33 ft. (10 m) | More than 33 ft. (10 m) |
|---|---|---|
| Evacuation time | More than 10 minutes | More than 15 minutes |

## (5) Recharging

● *Be sure to charge the specified amount of refrigerant in liquid state* using the service port of the wide tube service valve. The proper amount is listed on the unit's nameplate.

When the entire amount cannot be charged all at once, charge gradually while operating the unit in Cooling Operation.

⚠ | CAUTION | **Never charge a large amount of liquid refrigerant at once to the unit. This may cause damage to the compressor.**

● When charging with a refrigerant cylinder, use an electronic scale for charging refrigerant. In this case, if the volume of refrigerant in the cylinder becomes less than 20% of the fully-charged amount, the composition of the refrigerant starts to change. Thus, *do not use the refrigerant if the amount in the charging cylinder is less than 20%.*

Also, charge the minimum necessary amount to the charging cylinder before using it to charge the air conditioning unit.

### Example:

In case of charging refrigerant to a unit requiring 1.68 lb. (0.76 Kg) using a capacity of a 22 lb. (10 Kg) cylinder, the minimum necessary amount for the cylinder is:

$$1.68 + 22 \times 0.20 = 6.08 \text{ lb.}$$
$$(0.76 + 10 \times 0.20 = 2.76 \text{ Kg})$$

● *For the remaining refrigerant, refer to the instructions of the refrigerant manufacturer.*

If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

Prepare an evacuated charging cylinder beforehand.

⚠ | CAUTION | ● **To prevent the composition of R410A from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 3)**

*Do not use the refrigerant if the amount in the charging cylinder is less than 20%.*

## Configuration and characteristics of cylinders
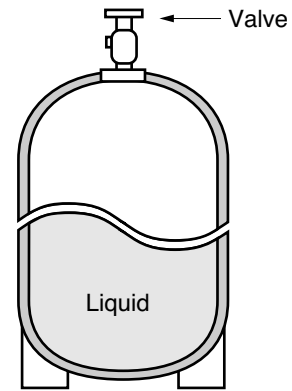
Valve

Liquid

**Single valve**
Charge liquid refrigerant with cylinder in up-side-down position.

**Fig. 1**

Valve

Liquid

**Single valve (with siphon tube)**
Charge with cylinder in normal position.

**Fig. 2**

NO!

Charging cylinder

Open

Liquid

Refrigerant cylinder

**Fig. 3**

# 9-6. In Case Refrigerant is Leaking

⚠ **CAUTION** **Never attempt to charge additional refrigerant when refrigerant has been leaking from the unit. Follow the procedure described below to locate points of leaks and carry out repairs, then recharge the refrigerant.**

**(1) Detecting Leaks**

- Use the detector for R410A to locate refrigerant leak points.

**(2) Recovering refrigerant**

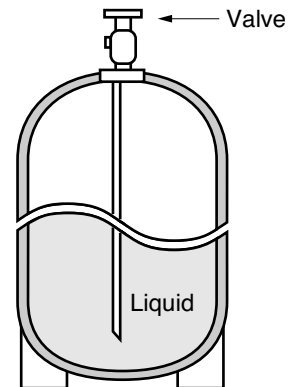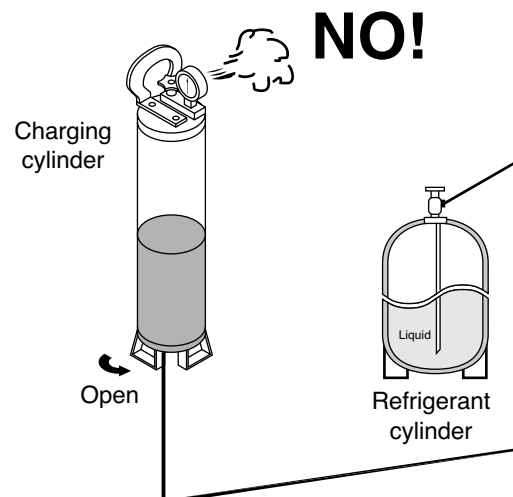- Never release the gas to the atmosphere; recover residual refrigerant using the refrigerant recovery unit for R410A, instead.
- Do not reuse the recovered refrigerant because its composition will have been altered.

**(3) Welding leaking points**

- Confirm again that no residual refrigerant exists in the unit before starting welding.
- Weld securely using flux and wax for R410A.
- Prevent oxide film from forming inside the tubes utilizing substitution with nitrogen (N2) in the refrigerant circuit of the unit. Leave ends of tubes open during welding.

**(4) Checking for sealing**

- Use nitrogen gas for the pressurized gas, and never use a refrigerant other than R410A. Also do not use oxygen or any flammable gas.

**(5) Evacuation**

- *Use a solenoid valve-installed vacuum pump* so that even if power is cut off in the middle of evacuation of air due to a power interruption, the valve will prevent the pump oil from flowing back.
- The equipment may be damaged if moisture remains in the tubing, thus carry out the evacuation thoroughly.
- When using a vacuum pump with exhaust air volume more than 0.883 cu.ft./min. and ultimate vacuum pressure rate of 50 micron Hg.

**Standard time for evacuation**

| Length of tubing | Less than 33 ft. (10 m) | More than 33 ft. (10 m) |
|---|---|---|
| Evacuation time | More than 10 minutes | More than 15 minutes |

**(6) Recharging**

- Recharge unit in the same manner explained on the previous page "(5) Recharging."

---

(1) Detect leaks

↓ OK

(2) Recover refrigerant

↓ OK

(3) Weld leaking points

↓ OK

(4) Check for sealing

↓ OK

(5) Evacuation

↓ OK

(6) Recharge

---
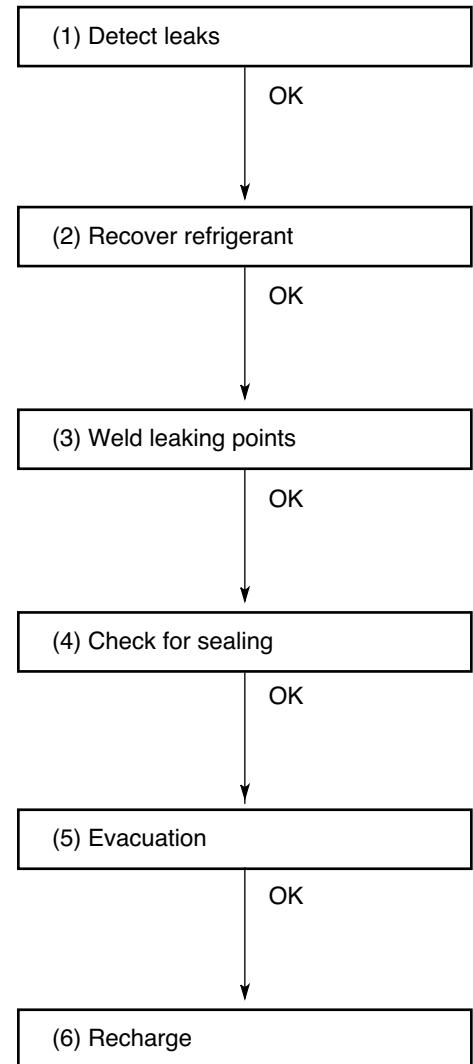
## 9-7. Charging Additional Refrigerant

### 9-7-1. When Tubes are Extended

● Observe the proper amount of refrigerant as stated in this service manual or the installation manual that came with the indoor unit. *Charge additional refrigerant in liquid state only.*

| ⚠ CAUTION | **Never charge additional refrigerant if refrigerant is leaking from the unit. Follow instructions given in "9-6. In Case Refrigerant is Leaking" and completely carry out repairs. Only then should you recharge the refrigerant.** |
|---|---|

## 9-8. Retro-Fitting Existing Systems

### 9-8-1. Use of Existing Units

● *Never use new refrigerant R410A for existing units which use R22.* This will cause the air conditioner to operate improperly and may result in a hazardous condition.

### 9-8-2. Use of Existing Tubing

● If replacing an older unit that used refrigerant R22 with a R410A unit, *do not use its existing tubing.* Instead, completely new tubing must be used.

# APPENDIX A  INSTALLATION INSTRUCTIONS

## CLM1972
## CLM2472
## CLM3172

(II-852-6-4190-214-00-1)

# SANYO    INSTALLATION  INSTRUCTIONS

## - Inverter Multi Split System Air Conditioner -    COOL/DRY Model

### This air conditioner uses the new refrigerant R410A.

## Contents

Page

**IMPORTANT!**
**Please Read Before Starting** ................................. **2**

---

**Model Combinations**

Combine indoor and outdoor units only as listed below.

| Indoor Unit | Outdoor Unit |
|---|---|
| KMS0772 | CM1972 |
| KMS0972 | CM2472 |
| KMS1272 | CM3172 |
| KMS1872 | CLM1972 |
| KMS2472 | CLM2472 |
|  | CLM3172 |

Combine indoor and outdoor units only as listed in the combination tables for 3-room or 4-room outdoor unit as shown in its respective manual.

Power Source:
60 Hz, single-phase, 230 / 208 VAC

---

**Be sure to read the yellow instruction sheet attached to the outdoor unit for models using the new refrigerant R410A.**

---

**Combination example**



Indoor unit B
Indoor unit A
Indoor unit C
Outdoor unit
Indoor unit D
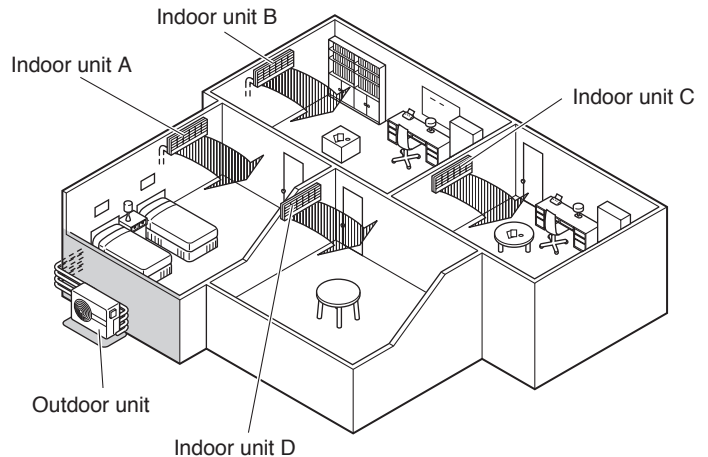
**NOTE**

The illustrations are based on the typical appearance of a standard model. Consequently, the shape may differ from that of the air conditioner that you are installing.

Ⓦ

# IMPORTANT!
# Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

**For safe installation and trouble-free operation, you must:**

● Carefully read this instruction booklet before beginning.

● Follow each installation or repair step exactly as shown.

● Observe all local, state, and national electrical codes.

● Pay close attention to all warning and caution notices given in this manual.

⚠ **WARNING** — This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

⚠ **CAUTION** — This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

## If Necessary, Get Help
These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

## In Case of Improper Installation
The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

## SPECIAL PRECAUTIONS

**WARNING** **When Wiring**

⚡ **ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.**

· Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.

· Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death.**

· **Ground the unit** following local electrical codes.

· Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

## When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

## When Installing…

### …In a Ceiling or Wall
Make sure the ceiling/wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.

### …In a Room
Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

### …In Moist or Uneven Locations
Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

### …In an Area with High Winds
Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

### …In a Snowy Area (for Heat Pump-type Systems)
Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

## When Connecting Refrigerant Tubing

· Use the flare method for connecting tubing.

· Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.

· Check carefully for leaks before starting the test run.

## When Servicing

· Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.

· Keep your fingers and clothing away from any moving parts.

· Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.

## Others

⚠ **CAUTION**

· Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.

· Confirm upon completing installation that no refrigerant gas is leaking. If escaped gas comes in contact with a stove, gas water heater, electric room heater or other heat source, it can produce dangerously toxic gas.

· Do not install only a single indoor unit.

# 1. General

This booklet briefly outlines where and how to install the air conditioning system. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the system before beginning. If the electric wiring diagram does not appear in this manual, please check for the diagram on the indoor unit.

## 1-1. Tools Required for Installation (not supplied)

1. Standard screwdriver
2. Phillips head screwdriver
3. Knife or wire stripper
4. Tape measure
5. Carpenter's level
6. Sabre saw or key hole saw
7. Hacksaw
8. Core bits
9. Hammer
10. Drill
11. Tube cutter
12. Tube flaring tool
13. Torque wrench
14. Adjustable wrench
15. Reamer (for deburring)
16. Vacuum pump (For R410A)
17. Manifold valve

## 1-2. Accessories Supplied with Unit

**Table 1**

| Parts | Figure | Q'ty | Parts | Figure | Q'ty | Parts | Figure | Q'ty |
|---|---|---|---|---|---|---|---|---|
| Hex wrench | | 1 | Cushion rubber | | 4 | Reducer (1/2" × 3/8") | | 2472 — 1 |
| | | | | | | | | 3172 — 2 |
| Labels for inter-unit cable and tube | A B C D | 4 each | Reducer (3/8" × 1/2") | | 1972 — 1 | | Packed in the outdoor unit. | |

## 1-3. Optional Copper Tubing Kit

Copper tubing for connecting the outdoor unit to the indoor unit is available in kits which contain the narrow and wide tubing, fittings and insulation. Consult your nearest sales outlet or A/C workshop.

## 1-4. Type of Copper Tube and Insulation Material

If you wish to purchase these materials separately from a local source, you will need:

1. Deoxidized annealed copper tube for refrigerant tubing as detailed in Table 2.

   Cut each tube to the appropriate lengths 1' to 1'4" (30 cm to 40 cm) to dampen vibration between units.

2. Foamed polyethylene insulation for the specified copper tubes as required to precise length of tubing. Wall thickness of the insulation should be not less than 5/16" (8 mm).

3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring.
   Refer to 5. Wiring Instructions for details.

⚠️ **CAUTION** **Check local electrical codes and regulations before obtaining wire. Also, check any specified instructions or limitations.**

**Table 2**

| Model | Narrow Tube | | Wide Tube | |
|---|---|---|---|---|
| | Outer Dia. | Thickness | Outer Dia. | Thickness |
| KMS0772 | 1/4" (6.35 mm) | 0.0314" (0.8 mm) | 3/8" (9.52 mm) | 0.0314" (0.8 mm) |
| KMS0972 | 1/4" (6.35 mm) | 0.0314" (0.8 mm) | 3/8" (9.52 mm) | 0.0314" (0.8 mm) |
| KMS1272 | 1/4" (6.35 mm) | 0.0314" (0.8 mm) | 3/8" (9.52 mm) | 0.0314" (0.8 mm) |
| KMS1872 | 1/4" (6.35 mm) | 0.0314" (0.8 mm) | 1/2" (12.70 mm) | 0.0314" (0.8 mm) |
| KMS2472 | 1/4" (6.35 mm) | 0.0314" (0.8 mm) | 5/8" (15.88 mm) | 0.0393" (1.0 mm) |

### 1-5. Additional Materials Required for Installation

1. Refrigeration (armored) tape
2. Insulated staples or clamps for connecting wire (See local codes)
3. Putty
4. Refrigeration lubricant
5. Clamps or saddles to secure refrigerant tubing

## 2. Installation Site Selection

### 2-1. Indoor Unit

⚠️ **WARNING** — **To prevent abnormal heat generation and the possibility of fire, do not place obstacles, enclosures and grilles in front of or surrounding the air conditioner in a way that may block air flow.**

**AVOID:**

● direct sunlight.

● nearby heat sources that may affect performance of the unit.

● areas where leakage of flammable gas may be expected.

● placing or allowing any obstructions near the A/C inlet or outlet.

● installing in rooms that contain instant-on (rapid-start) fluorescent lamps. (These may prevent the A/C from receiving signals.)

● places where large amounts of oil mist exist.

● installing in locations where there are devices that generate high-frequency emissions.

**DO:**

● select an appropriate position from which every corner of the room can be uniformly cooled. (High on a wall is best.)

● select a location that will hold the weight of the unit.

● select a location where tubing and drain hose have the shortest run to the outside. (Fig. 1)

● allow room for operation and maintenance as well as unrestricted air flow around the unit. (Fig. 2)

● install the unit within the maximum elevation difference (H1, H2, H3, H4) above or below the outdoor unit and within a total tubing length (L1+L2+L3, L1+L2+L3+L4) from the outdoor unit as detailed in Table 3 and Fig. 3a.
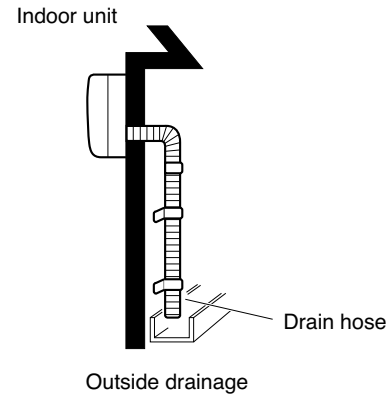


**Fig. 1**
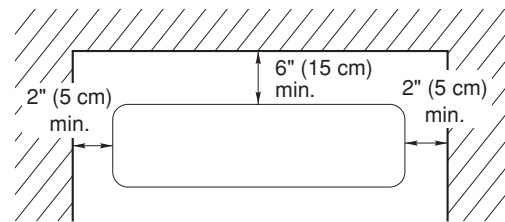


**Front View**

**Fig. 2**
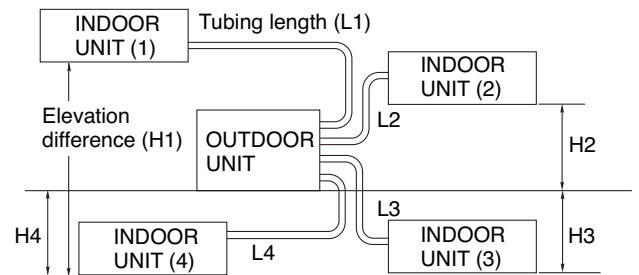


**Fig. 3a**

⚠️ **CAUTION**

**For stable operation of the air conditioner, do not install wall-mounted type indoor units less than 5' (1.5 m) from floor level.**



**Fig. 3b**

4
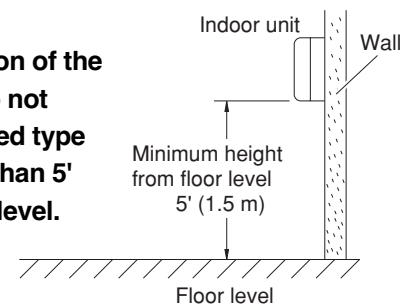
- Install the indoor unit more than 3.3' (1 m) away from any antenna or power lines or connecting wires used for television, radio, telephone, security system, or intercom. Electrical noise from any of these sources may affect operation.
- install in a sturdy manner to avoid increased operating noise.

**Table 3**

| Model | Max. Allowable Tubing Length per unit (ft.) | Max. Allowable Total Tubing Length at shipment (L1+L2+L3) or (L1+L2+L3+L4) (ft.) | Limit of Total Tubing Length (L1+L2+L3) or (L1+L2+L3+L4) (ft.) | Limit of Elevation Difference (H1, H2, H3, H4) (ft.) | Required Amount of Additional Refrigerant (oz./ft.)* |
|---|---|---|---|---|---|
| CM1972/CLM1972 | 82 | 150 (L1+L2+L3) | 150 (L1+L2+L3) | 50 | — |
| CM2472/CLM2472 | 82 | 150 (L1+L2+L3+L4) | 200 (L1+L2+L3+L4) | 50 | 0.22 |
| CM3172/CLM3172 | 100 | 150 (L1+L2+L3+L4) | 230 (L1+L2+L3+L4) | 50 | 0.22 |

* If total tubing length becomes 150 to 200 ft. (Max.) or 150 to 230 ft. (Max.), charge additional refrigerant (R410A) by 0.22 oz./ft. No additional charge of compressor oil is necessary.

## 2-2. Connecting Indoor Units

(1) Connecting indoor unit for CM1972/CLM1972

(A)

**Fig. 4a**

(B)

**Fig. 4b**

(2) Connecting indoor unit for CM2472/CLM2472

(A)

**Fig. 4c**

(B)



**Outdoor unit**   **Indoor unit**

D — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

C — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

B — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

A — 1/2"(12.70mm) — (KMS1872)
1/2"(12.70mm)   1/4"(6.35mm)

**Fig. 4d**


(C)



**Outdoor unit**   **Indoor unit**

D — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

C — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

B — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

A — 5/8"(15.88mm) — (KMS2472)
1/2"(12.70mm)   1/4"(6.35mm)

Flare 1/2"(12.70mm)   Union 5/8"(15.88mm)
(1/2"(12.70mm) → 5/8"(15.88mm)) Locally purchased

**Fig. 4e**


(D)



**Outdoor unit**   **Indoor unit**

D — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

C — 3/8"(9.52mm) — (KMS0772,KMS0972,KMS1272)
3/8"(9.52mm)   1/4"(6.35mm)

B — 1/2"(12.70mm) — (KMS1872)
3/8"(9.52mm)   1/4"(6.35mm)

A — 5/8"(15.88mm) — (KMS2472)
1/2"(12.70mm)   1/4"(6.35mm)

Flare 1/2"(12.70mm)   Union 5/8"(15.88mm)   Flare 3/8"(9.52mm)   Union 1/2"(12.70mm)
(1/2"(12.70mm) → 5/8"(15.88mm))   (3/8"(9.52mm) → 1/2"(12.70mm))
Locally purchased   Locally purchased

**Fig. 4f**

(3) Connecting indoor unit for CM3172/CLM3172

(A)

**Outdoor unit**　　　　　　　　　　　　　　　　　　**Indoor unit**

D　　　　　　　　　　　3/8"(9.52mm)
3/8"(9.52mm)　　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
C　　　　　　　　　　　3/8"(9.52mm)
3/8"(9.52mm)　　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
B　　　　　　　　　　　3/8"(9.52mm)
1/2"(12.70mm)　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
A　　　　　　　　　　　3/8"(9.52mm)
1/2"(12.70mm)　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　　　　　1/4"(6.35mm)

Flare 1/2"(12.70mm)　　Union 3/8"(9.52mm)

(1/2"(12.70mm) → 3/8"(9.52mm)) Supplied Reducer

**Fig. 4g**

(B)

**Outdoor unit**　　　　　　　　　　　　　　　　　　**Indoor unit**

D　　　　　　　　　　　3/8"(9.52mm)
3/8"(9.52mm)　　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
C　　　　　　　　　　　3/8"(9.52mm)
3/8"(9.52mm)　　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
B　　　　　　　　　　　3/8"(9.52mm)
1/2"(12.70mm)　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
A　　　　　　　　　　　1/2"(12.70mm)
1/2"(12.70mm)　　　　　　　　　　　　　　　　　　　(KMS1872)
　　　　　　　　　　　　1/4"(6.35mm)

Flare 1/2"(12.70mm)　　Union 3/8"(9.52mm)

(1/2"(12.70mm → 3/8"(9.52mm)) Supplied Reducer

**Fig. 4h**

(C)

**Outdoor unit**　　　　　　　　　　　　　　　　　　**Indoor unit**

D　　　　　　　　　　　3/8"(9.52mm)
3/8"(9.52mm)　　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
C　　　　　　　　　　　3/8"(9.52mm)
3/8"(9.52mm)　　　　　　　　　　　　　　　　　　　　(KMS0772,KMS0972,KMS1272)
　　　　　　　　1/4"(6.35mm)
B　　　　　　　　　　　1/2"(12.70mm)
1/2"(12.70mm)　　　　　　　　　　　　　　　　　　　(KMS1872)
　　　　　　　　1/4"(6.35mm)
A　　　　　　　　　　　1/2"(12.70mm)
1/2"(12.70mm)　　　　　　　　　　　　　　　　　　　(KMS1872)
　　　　　　　　1/4"(6.35mm)

**Fig. 4i**

(D)

**Outdoor unit**                                        **Indoor unit**

3/8"(9.52mm)

D
3/8"(9.52mm)                    1/4"(6.35mm)                            (KMS0772,KMS0972,KMS1272)

3/8"(9.52mm)

C
3/8"(9.52mm)                    1/4"(6.35mm)                            (KMS0772,KMS0972,KMS1272)

3/8"(9.52mm)

B
1/2"(12.70mm)                   1/4"(6.35mm)                            (KMS0772,KMS0972,KMS1272)

5/8"(15.88mm)

A
1/2"(12.70mm)                   1/4"(6.35mm)                            (KMS2472)

Flare 1/2"(12.70mm)   Union 5/8"(15.88mm)      Flare 1/2"(12.70mm)      Union 3/8"(9.52mm)
(1/2"(12.70mm) → 5/8"(15.88mm))                (1/2"(12.70mm) → 3/8"(9.52mm))
Locally purchased                               Supplied Reducer

**Fig. 4j**


(E)

**Outdoor unit**                                        **Indoor unit**

3/8"(9.52mm)

D
3/8"(9.52mm)                    1/4"(6.35mm)                            (KMS0772,KMS0972,KMS1272)

3/8"(9.52mm)

C
3/8"(9.52mm)                    1/4"(6.35mm)                            (KMS0772,KMS0972,KMS1272)

1/2"(12.70mm)

B
1/2"(12.70mm)                   1/4"(6.35mm)                            (KMS1872)

5/8"(15.88mm)

A
1/2"(12.70mm)                   1/4"(6.35mm)                            (KMS2472)

Flare 1/2"(12.70mm)   Union 5/8"(15.88mm)
(1/2"(12.70mm) → 5/8"(15.88mm)) Locally purchased

**Fig. 4k**

## 2-3. Outdoor Unit

**AVOID:**

● heat sources, exhaust fans, etc. (Fig. 5a)

● damp, humid or uneven locations.

**DO:**

● choose a place as cool as possible.

● choose a place that is well ventilated.

● allow enough room around the unit for air intake/ exhaust and possible maintenance. (Fig. 5b)

● provide a solid base (level concrete pad, concrete block, 6" × 1'4" (15 × 40 cm) beams or equal), a minimum of 6" (15 cm) above ground level to reduce humidity and protect the unit against possible water damage and decreased service life. (Figs. 5c and 5d)

⚠️ **CAUTION** **A solid base must not cover the hole of the bottom plate.**

● Install cushion rubber under unit's feet to reduce vibration and noise. (Fig. 5e)

● use lug bolts or equal to bolt down unit, reducing vibration and noise.

● Install in a location where no antenna of a television or radio exists within 10' (3 m).

## 2-4. Baffle Plate for the Outdoor Unit (CLM models only)

**NOTE**
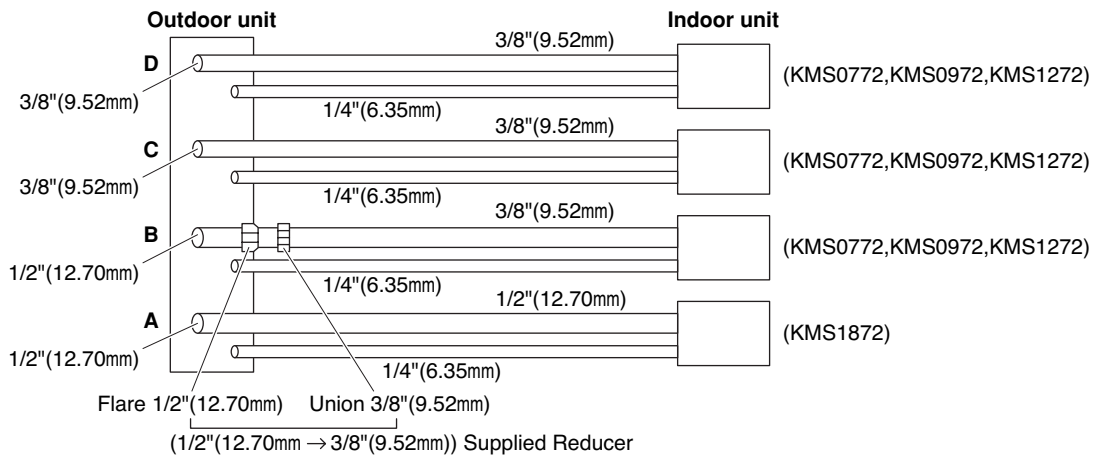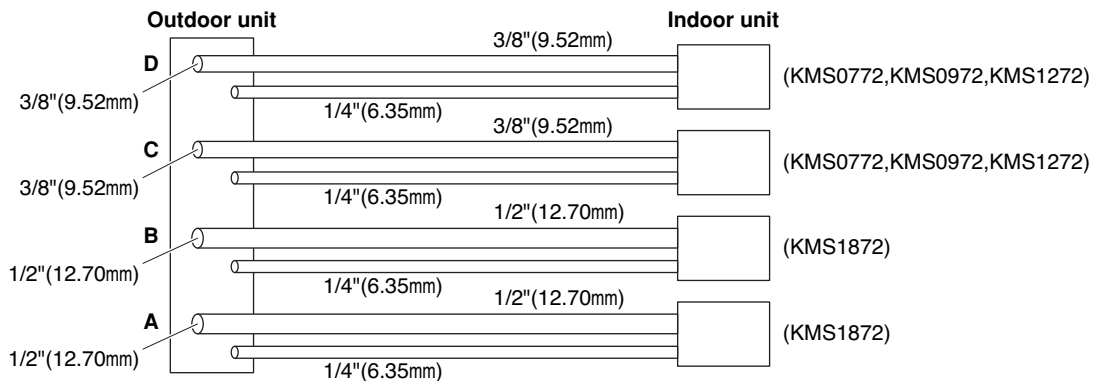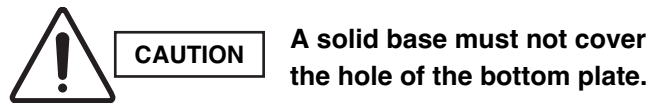
It is recommended to use baffle plates for models CLM1972, CLM2472 and CLM3172. The baffle plates are not normally required for the other models.

When the outdoor unit is installed in a position exposed to strong wind (like seasonal winds with low air temperature in winter), baffle plates must be installed at the rear of the outdoor unit. (Fig. 5f)

This unit is designed so that the fan of the outdoor unit runs at low speed when the air conditioner is operated at low outdoor air temperatures. When the outdoor unit is exposed to strong wind, the system pressure drops because of the freeze protector.
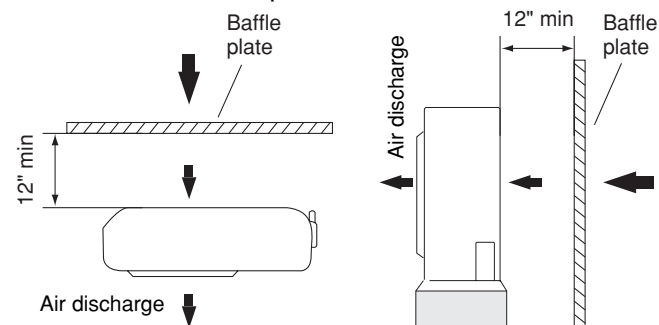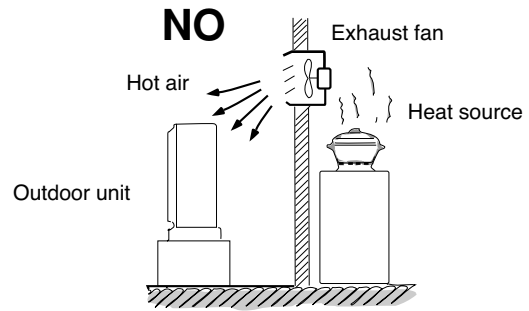


**Fig. 5a**
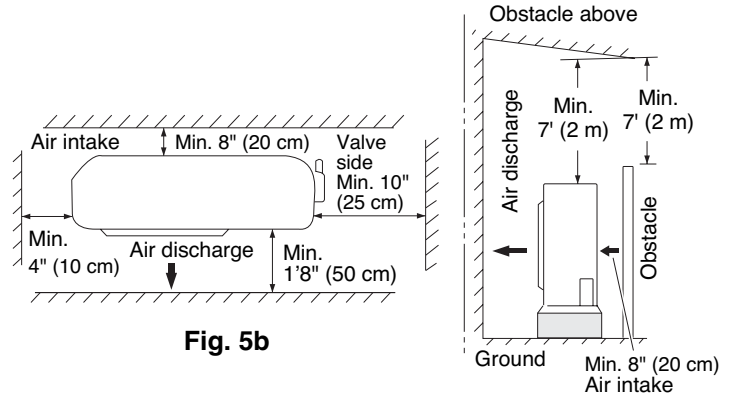


**Fig. 5b**



**Fig. 5c**



**Fig. 5d**



**Fig. 5f**
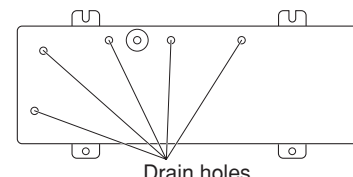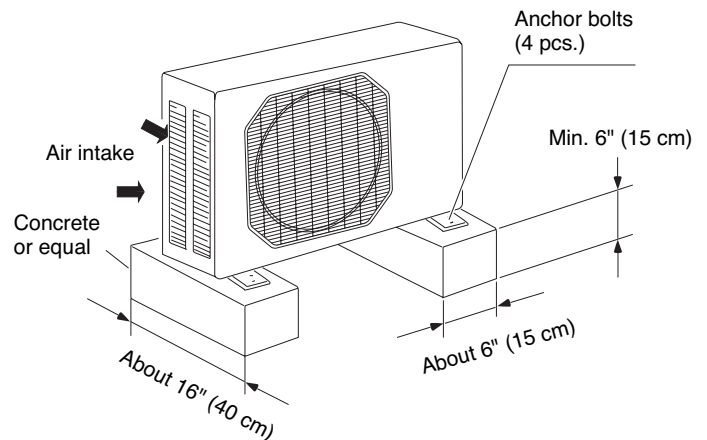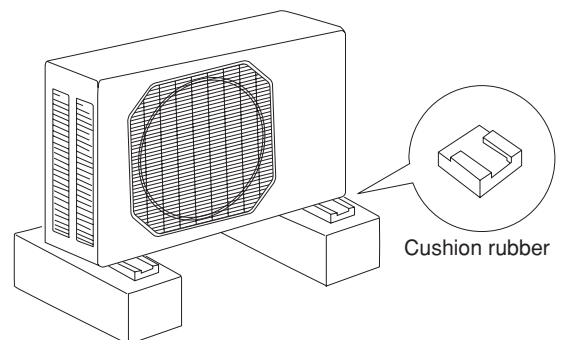


**Fig. 5e**

## 2-5. Outer Dimensions of Outdoor Unit

### (1) CM1972/CLM1972

**Fig. 6a**

### (2) CM2472/CLM2472

Service valve on narrow tube side
(Outer diameter 1/4"(6.35))

Service valve on wide tube side
(Outer diameter 3/8"(9.52))

Service valve on wide tube side
(Outer diameter 1/2"(12.70))

**Fig. 6b**

### (3) CM3172/CLM3172

Service valve on narrow tube side
(Outer diameter 1/4"(6.35))

Service valve on wide tube side
(Outer diameter 3/8"(9.52))

Service valve on wide tube side
(Outer diameter 1/2"(12.70))
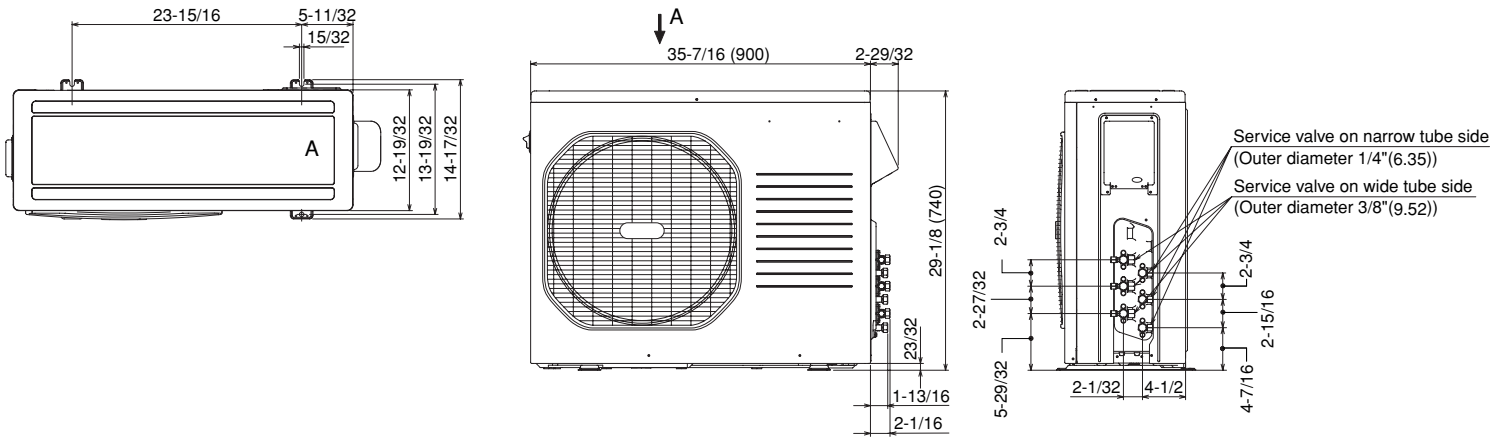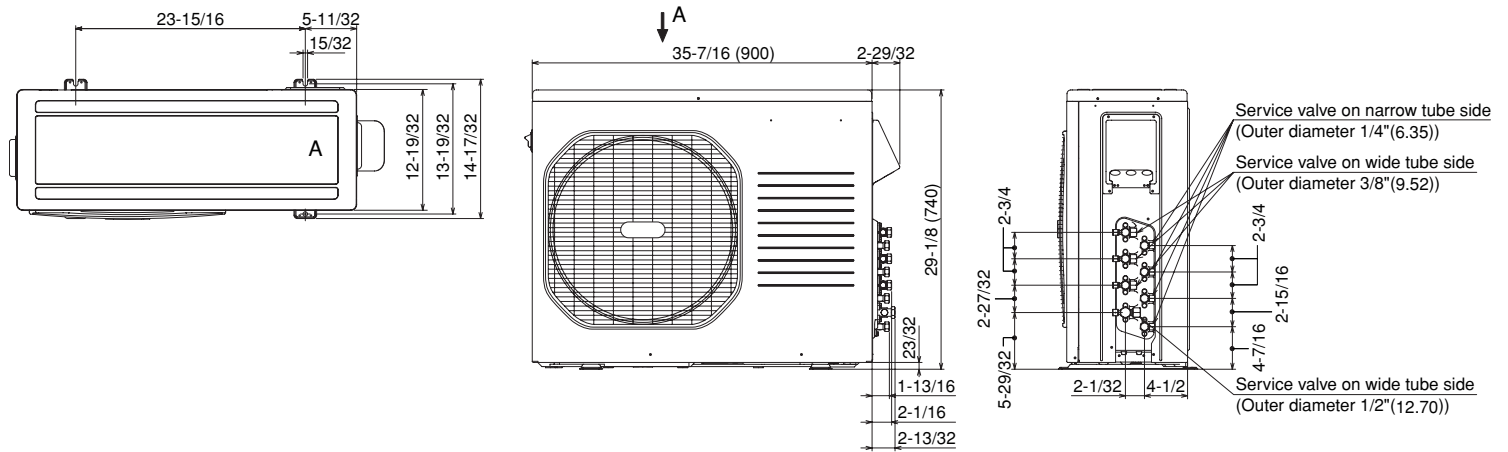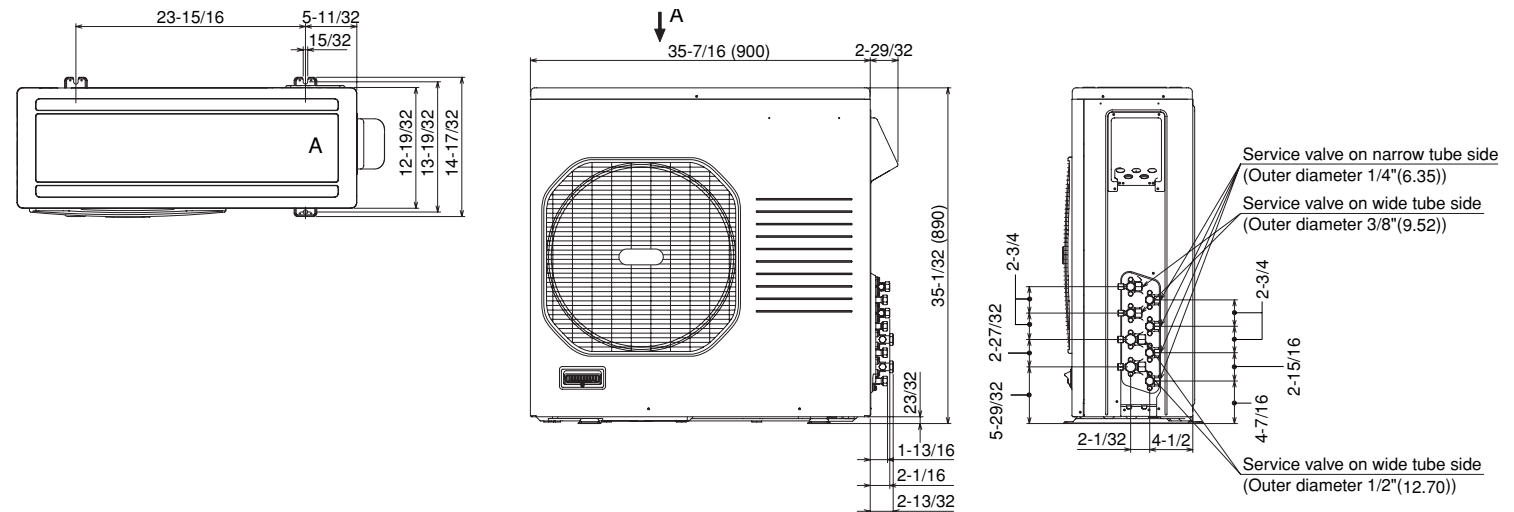
**Fig. 6c**

unit: inch (mm)

## 2-6. Diagram of Outdoor Unit Installation

**Never install only a single indoor unit.**

Be sure to connect indoor and outdoor units only in combinations that are listed in the catalog or in the combination table that was provided with the outdoor unit. (Use caution. Connecting any other model may result in operation failure and malfunction.)

The dimensions indicated by ⇔ in the figure below are spaces that are required in order to maintain performance. Install in a location where the dimensions indicated by ⇔ are ensured, and where 2 or more faces of the unit are unobstructed. In principle, the top direction should be unobstructed.

Indoor unit D

Indoor unit C

Indoor unit B

Indoor unit A

Over 8"(20cm)

Over 4"(10cm)

Power breaker

Service space

Over 10"(25cm)

Ensure 6"(15cm) of space if a drain hose is to be used.

Access panel "C"

D
C
B
A

Over 1'8"(50cm)

Base (not provided) (concrete or similar material)

Fasten with anchor bolts (not provided) (3/8" or M10, 4 locations)

Ground wire (not provided)

**Fig. 7**

## 3. Installation Process

### 3-1. Embedding the Tubing and Wiring

● Do not connect tubes to locations that are embedded.

● Be sure to bind refrigerant tubing and inter-unit cables together with vinyl tape.

● The power cable must be obtained on-site.
(#12: Less than 85 ft.)
# ... AWG (American Wire Gauge)

● Be sure to apply the provided labels to both ends of the inter-unit cables to prevent miswiring.

● Securely seal the end of embedded tubing with vinyl tape in order to prevent dirt or moisture entry.

● In order to prevent insulation breakdown and ground faults, do not allow the wire ends to contact rainwater, or be subject to dew condensation.

### 3-2. Use of the Flaring Method

Many of the conventional split system air conditioners employ the flaring method to connect refrigerant tubes which run between indoor and outdoor units. In this method, the copper tubes are flared at each end and connected with flare nuts.

### 3-3. Flaring Procedure with a Flare Tool

(1) Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 12" to 20" (30 to 50 cm) longer than the tubing length you estimate.

(2) Remove burrs at the end of the copper tube with a tube reamer or file. This process is important and should be done carefully to make a good flare.
(Fig. 8)

**Deburring**

Before

After

**Fig. 8**

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube. (Fig. 9)

(3) Remove the flare nut from the unit and be sure to mount it on the copper tube.

(4) Make a flare at the end of copper tube with a flare tool.*
(Figs. 10 and 11)

(∗Use "RIGID" or equivalent.)

A good flare should have the following characteristics:

● inside surface is glossy and smooth.

● edge is smooth.

● tapered sides are of uniform length.

### 3-4. Caution before Connecting Tubes Tightly
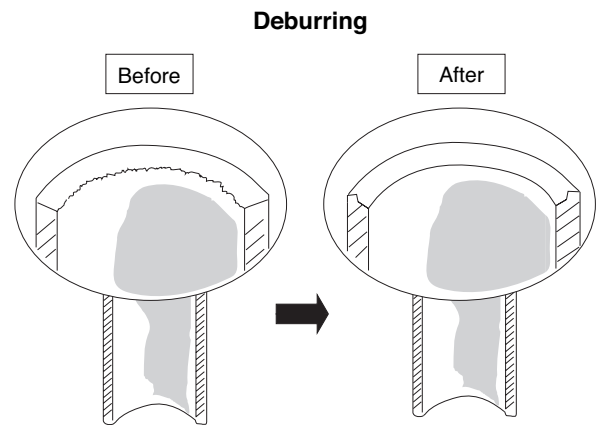
a) Be sure to apply a sealing cap or water-proof tape to prevent dust or water from getting into the tubes before they are used.

b) Be sure to apply refrigerant lubricant to the matching surfaces of the flare and union before connecting them together. This is effective for reducing gas leaks. (Fig. 12)

c) For proper connection, align the union tube and flare tube straight with each other, then screw in the flare nut lightly at first to obtain a smooth match. (Fig. 13)

### 3-5. Tubing Connections

a) Temporary connection:
Screw in 3 – 5 rotations by hand. (Fig.14)

b) To fasten the flare nuts, apply specified torque as:

**Table 4**

| Tube Dia. | Tightening Torque |
|---|---|
| 1/4" (6.35 mm) | Approx. 120 – 160 lbs·in (140 – 180 kgf·cm) |
| 3/8" (9.52 mm) | Approx. 300 – 360 lbs·in (340 – 420 kgf·cm) |
| 1/2" (12.70 mm) | Approx. 430 – 540 lbs·in (490 – 610 kgf·cm) |
| 5/8" (15.88 mm) | Approx. 590 – 710 lbs·in (680 – 820 kgf·cm) |

Copper tubing

Reamer
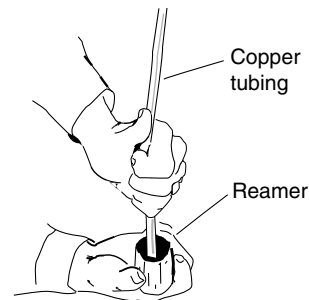
**Fig. 9**

**If the special R410A flare tool is used:**

0 to 0.0196" (0 to 0.5 mm)
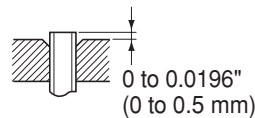
**If the previous flare tool (clutch-type) is used:**

0.0472" (1.2 mm)
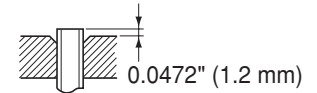
Adjust so that the amount of tube protrusion is as shown in the figure.

**Fig. 10**

Flare nut

Copper tubing

Flare tool

**Fig. 11**

Apply refrigerant lubricant here and here

**Fig. 12**

Union    Flare nut
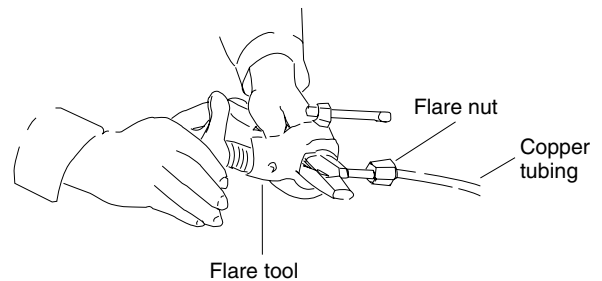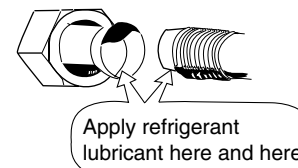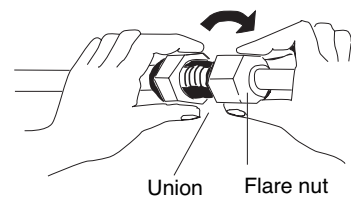
**Fig. 13**

Service valve on narrow tube side

Service valve on wide tube side

D
C
B
A

Apply the provided labels to the indoor and outdoor unit tubing connectors to prevent errors in connections.

**Fig. 14**

Fig. 15

| CAUTION | Be sure to match refrigerant tubing and electric wiring between indoor and outdoor units. For more details, refer to "Tubing Check Control" in the Technical & Service Manual. |
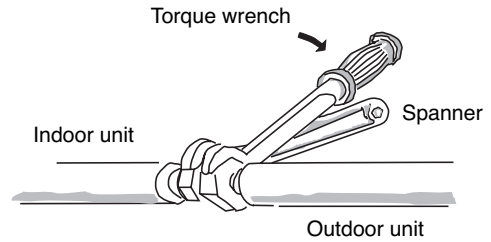
## 3-6. Insulation of Refrigerant Tubing

**IMPORTANT**

To prevent heat loss and wet floors due to dripping of condensation, **both tubes must be well insulated with a proper insulation material.**
The thickness of the insulation should be a minimum 5/16" (8 mm). (Fig. 17)
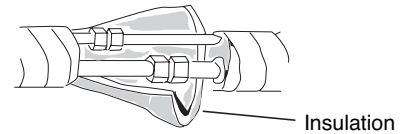

Fig. 16

## 3-7. Taping the Tubes

| CAUTION | After a tube has been insulated, never try to bend it into a narrow curve, as this may cause the tube to break or crack. |
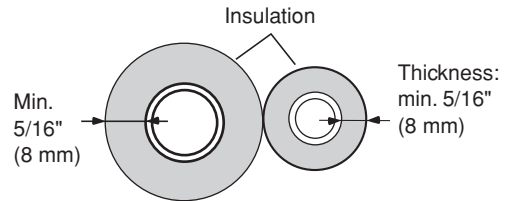
(1) At this time, the 2 refrigerant tubes (and electrical wire if local codes permit) should be taped together with armoring tape. The drain hose may also be included and taped together as 1 bundle with the tubing.

(2) Wrap the armoring tape from the bottom of the outdoor unit to the top of the tubing where it enters the wall. As you wrap the tubing, overlap half of each previous tape turn. (Fig. 18)

(3) Clamp the tubing bundle to wall, using 1 clamp approx. every 47" (120 cm).
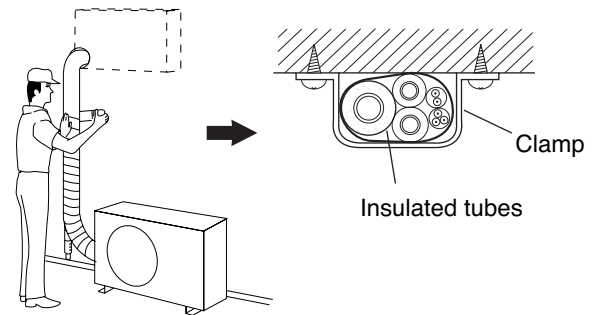
**NOTE**

Do not wind the armoring tape too tightly, since this will decrease the heat insulation effect. Also, be sure the condensation drain hose splits away from the bundle and drips clear of the unit and the tubing.

## 3-8. Finishing the Installation

After finishing insulating and taping over the tubing, use sealing putty to seal off the hole in the wall to prevent rain and draft from entering. (Fig. 19)


Fig. 17


Fig. 18
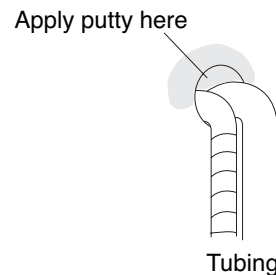

Fig. 19

## 4. Air Purging

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below. Therefore, they must be purged completely.

● pressure in the system rises

● operating current rises

● cooling efficiency drops

● moisture in the air may freeze and block capillary tubing

● water may lead to corrosion of parts in the refrigerant system

### ■ Air Purging with a Vacuum Pump (for Test Run)

● In order to protect the earth's environment, be sure to use a vacuum pump to perform the air purge.
(Never perform an air purge by using the refrigerant gas cylinder or other external gas, or by using the gas inside the outdoor unit.)



Service valve on narrow

Service valve on wide tube side

Hex wrench

With push-pin

Manifold gauge (special for R410A)

Low-pressure valve

High-pressure valve

Vacuum pump adapter (for preventing reverse flow) (special for R410A)

Leave the valve open.

Open

Charging hose (special for R410A)

Vacuum pump

**Fig. 20**

⚠ **CAUTION** | **In order to prevent charging errors with A/C that uses R410A, the screw diameter at the service valve charging port has been changed. When recharging or performing other servicing, use the special charging hose and manifold gauge.**

Perform the air purge for tubes A, B, C, and D. Use the same procedures for all tubes.

(1) Check that each tube (both narrow and wide tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Note that both narrow and wide tube service valves on the outdoor unit are kept closed at this stage.

(2) Using an adjustable wrench or box wrench, remove the valve caps from the service valve on both narrow and wide tubes.

(3) Connect a vacuum pump and a manifold valve (with pressure gauges) to the service port on the wide tube service valve. (Fig. 20).

⚠ **CAUTION** | **Before using the vacuum pump adapter, read the vacuum pump adapter manual, and use the adapter correctly.**

⚠ **CAUTION** | **Be sure to use a manifold valve for air purging. If it is not available, use a stop valve for this purpose. The "Hi" knob of the manifold valve must always be kept closed.**



Stopper

Spindle

Screw diameter: 1/2 UNF 20 threads

Valve core

Cap tightening torque: 170 – 215 lbs·in (200 – 250 kgf·cm) (Tighten by hand, then use a wrench to turn.)

Cap nut tightening torque: 60 – 95 lbs·in (70 – 110 kgf·cm) (Tighten by hand, then use a wrench to turn approximately 30°.)

**<Structure of service valve on wide tube side>**

**Fig. 21**

● When using a hex wrench to open the spindle, an extremely small amount of refrigerant may leak. This does not indicate a problem.

● Use a hex wrench of a type to which force can be easily applied.

(4) With the "Lo" knob of the manifold valve open and high-pressure valve ("Hi") closed completely, run the vacuum pump. Run the pump until the pressure is –101 kPa (–76 cmHg). The operation time for the vacuum pump varies with tubing length and the capacity of the pump. The following table shows the amount of time required for evacuation:

**Table 5**

| Required time for evacuation when capacity of 100 liter/h vacuum pump is used |
| --- |
| **20 min. or more** |

**NOTE**

The required time in the above table is calculated based on the assumption that the ideal (or target) vacuum condition is around 10 mmHg abs.

(5) With the vacuum pump still running, close the "Lo" knob of the manifold valve. Then stop the vacuum pump. Fully close the low-pressure valve and stop the vacuum pump. (Wait 1 – 2 minutes and check that the manifold gauge pointer does not return. If it does return, find and repair the leak, then apply the vacuum again.)

(6) With a hex wrench, turn the valve stem on the narrow tube service valve counter-clockwise by 90 degrees (1/4 turn) for 10 seconds, and then turn the stem clockwise to close it again.

**CAUTION** **Be sure to completely insert the hex wrench before attempting to turn the valve.**

(7) With a standard screwdriver, turn the wide tube service valve stem counterclockwise to fully open the valve.

(8) Turn the narrow tube service valve stem counter-clockwise to fully open the valve.

(9) Loosen the vacuum hose connected to the wide tube service port slightly to release the pressure. Then, remove the hose.

(10) Leak test all joints at the tubing (both indoor and outdoors) with liquid soap. Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth.

**CAUTION** **If a CFC gas detector is used, use a special detector for HFC refrigerant (such as R410 and R134a).**

(11) Replace the flare nut on the wide tube service port and fasten the flare nut securely with an adjustable wrench or box wrench. Next, mount the valve cap and tighten it with a torque wrench (the cap needs to be tightened with the torque of 180 lbs·in (200 kgf·cm)). This process is very important to prevent gas from leaking from the system.

(12) Test run the air conditioner. (See page 23.)

(13) While the air conditioner is running, apply liquid soap to check for any gas leaks around the service valves or caps.

(14) If there is no leakage, stop the air conditioner.

(15) Wipe off the soap on the tubing.

This completes air purging with a vacuum pump and the air conditioner is ready for actual operation.

## ■ Pump Down

> **In order to protect the earth's environment, be sure to perform pump-down to recover refrigerant gas without releasing it into the atmosphere.**

● When relocating or disposing of the A/C, request this service from the dealer where the unit was purchased, or from an appropriate agent. Perform pump-down as described below.

**What is pump-down?**
● Pump-down refers to recovering the refrigerant gas from the refrigerant cycle at the outdoor unit. This work must be performed during cooling operation. The refrigerant gas cannot be recovered during heating operation.
● During winter, or if the temperature sensor prevents cooling operation, perform "forced cooling operation."



**Fig. 22**

**Pump-down procedure**

(1) Fully close the spindles at the valves on the narrow tube side of tubes A, B, C and D. (Refer to Fig. 22.)

(2) Connect the manifold gauge to the charging port at the valve on the wide tube side of tube D. Purge the air from the charging hose. (Refer to Fig. 23.)

(3) Perform cooling operation or forced cooling operation.
When the pressure at the low-pressure side is 0.15 – 0.2 MPa (0.5 – 1 kg/cm$^2$G), fully close the spindles at the valves on the wide tube side of tubes A, B, C, and D, and immediately stop operation. (Refer to Fig. 23.)
In the winter, the outdoor unit may stop after 5 - 10 minutes of operation. This is in order to protect the indoor unit heat exchanger from freezing and does not indicate a problem.



**Fig. 23**

(4) Disconnect the manifold gauge and the inter-unit tubes, and attach the caps and flare nuts. At this point, pump-down is completed. (If the caps and flare nuts are not reattached, there is the danger of gas leakage.) (Refer to Fig. 24.)

**If pump-down is not possible**
If the A/C cannot be operated because of a malfunction or other cause, use a refrigerant recovery device to recover the refrigerant.
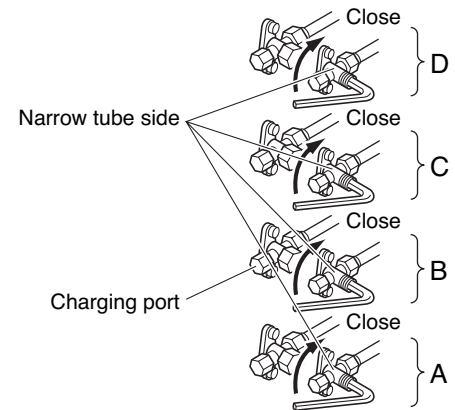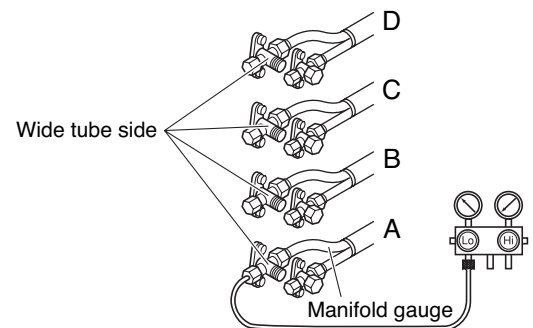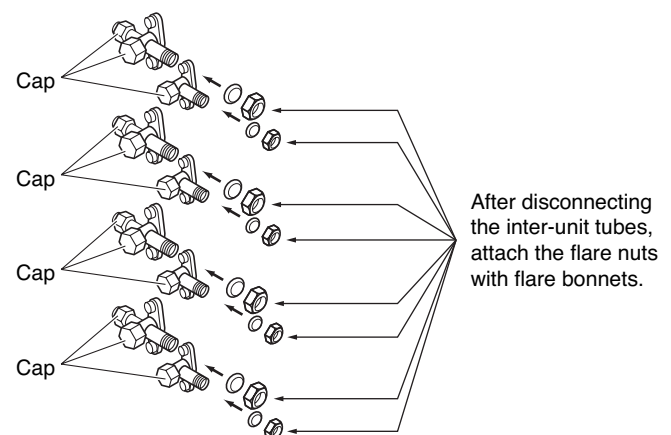


**Fig. 24**

# 5. Wiring Instructions

## 5-1. General Precautions on Wiring

(1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.

(2) Provide a power outlet to be used exclusively for each unit, with a power supply disconnect and circuit breaker for overcurrent protection provided in the exclusive line.

(3) To prevent possible hazard due to insulation failure, the unit must be grounded.

(4) Each wiring connection must be done tightly and in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.

(5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.

(6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.

## 5-2. Recommended Wire Length and Diameter

Regulations on wiring diameter differ from locality to locality. For field wiring requirements, please refer to your local electrical codes. Carefully observe these regulations when carrying out the installation.
Table 6 shows maximum wire lengths for control line and power line and fuse or circuit capacity.

**NOTE**

Refer to the wiring system diagram (Fig. 25a or 25b) for the meaning of (A), (B), and (C) in Table 6.

Refer to your local codes or in the absence of local codes see the National Electric Code: ANSI/NFPA70.

**Table 6**

| Model / AWG | Max. Power Line Length (ft.) (A) (#12) | Max. Control Line Length (ft.) (B) (C) (#14) | Fuse or Circuit Capasity |
|---|---|---|---|
| CM1972 / CLM1972 | 85 (Max.) | 82 (Max.) | 20 A |
| CM2472 / CLM2472 | 85 (Max.) | 82 (Max.) | 20 A |
| CM3172 / CLM3172 | 85 (Max.) | 100 (Max.) | 20 A |

# ... AWG (American Wire Gauge)

**WARNING**

● Be sure to comply with local codes on running the wire from the indoor unit to the outdoor unit (size of wire and wiring method, etc.).
● Each wire must be firmly connected.
● No wire should be allowed to touch refrigerant tubing, the compressor, or any moving part.
● Be sure to connect power wires correctly matching up numbers on terminals of the outdoor unit and respective indoor units A – D.

**CAUTION**

● Be sure to connect the power supply line to the outdoor unit as shown in the wiring diagram. The indoor unit draws its power from the outdoor unit.
● Do not run wiring for antenna, signal, or power lines of television, radio, stereo, telephone, security system, or intercom any closer than 3'4" (1 m) from the power cable and wires between the indoor and outdoor units. Electrical noise may affect the operation.

**WARNING**

● To avoid the risk of electric shock, each air conditioner unit must be grounded.
● For the installation of a grounding device, please observe local electrical codes.
● Grounding is necessary, especially for units using inverter circuits, in order to release charged electricity and electrical noise caused by high tension. Otherwise, electrical shock may occur.
● Place a dedicated ground more than 7' (2 m) away from other grounds and do not have it shared with other electric appliances.

**5-3. Wiring System Diagram**

**3 indoor units with CM1972/CLM1972**
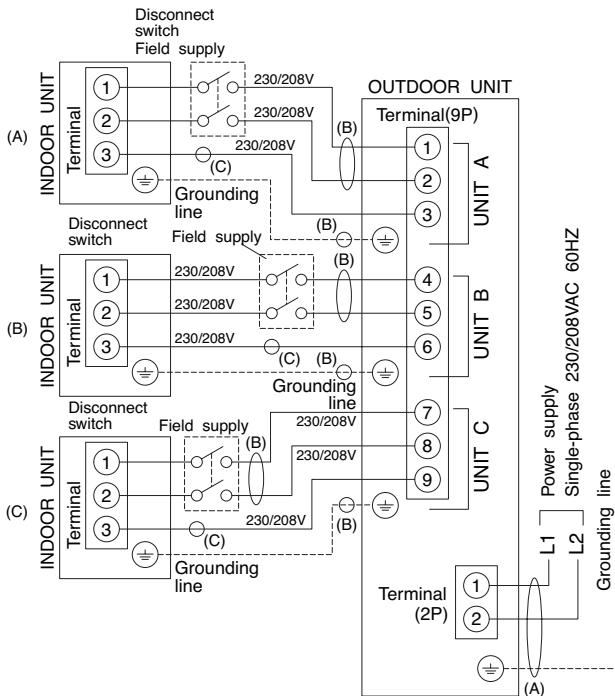


Fig. 25a

**4 indoor units with CM2472/CLM2472, CM3172/CLM3172**
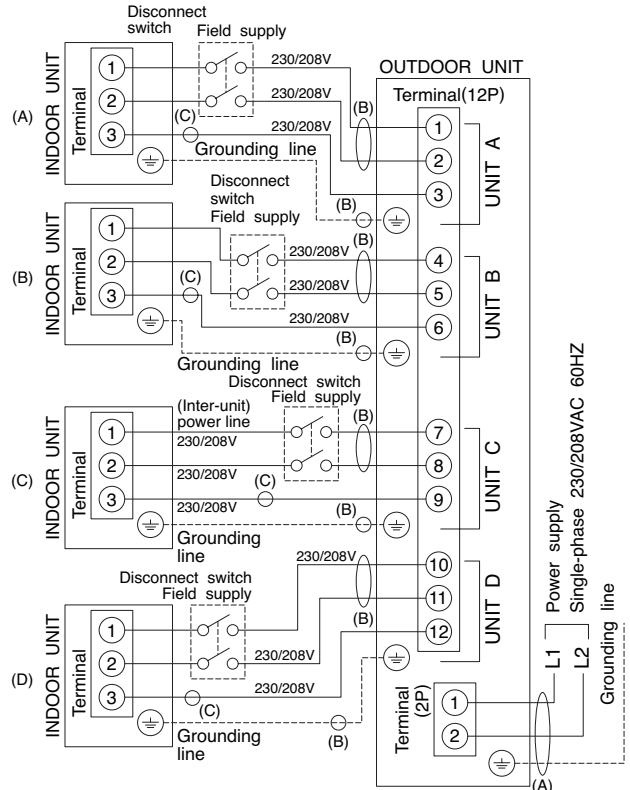


Fig. 25b

### 5-4. How to Connect Wiring to the Terminal

⚠ **WARNING** **Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.**

When connecting each power wire to the corresponding terminal, follow the instructions "How to connect wiring to the terminal" and fasten the wire securely tight with the fixing screw of the terminal plate.

**How to connect wiring to the terminal**

**a) For Indoor Unit**

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the wire about 9/32" (7 mm). See the label (Fig. 26) near the terminal plate.

(2) Using a screwdriver, loosen the terminal screw on the terminal plate.

(3) Insert the wire and tighten the terminal screw completely using a screwdriver.

**b) For Outdoor Unit**

■ **For solid core wiring (or F-cable)**

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the solid wire about 15/16" (25 mm). (Fig. 27)

(2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.

(3) Using the pliers, bend the solid wire to form a loop suitable for the terminal screw.

(4) Shape the loop wire properly, place it on the terminal plate and fix it securely with the removed terminal screw using a screwdriver.

■ **For stranded wiring**

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the stranded wiring about 3/8" (10 mm) and tightly twist the wire ends. (Figs. 28 and 29)

(2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.

(3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring connector. (Fig. 28)

(4) Place the ring connector wire, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 30)
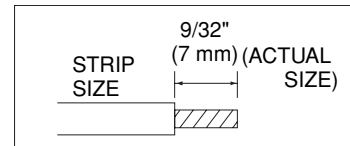


**Fig. 26**
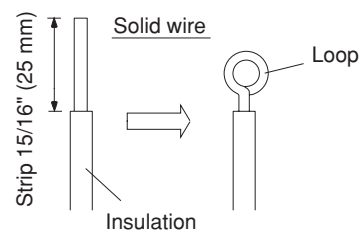


**Fig. 27**
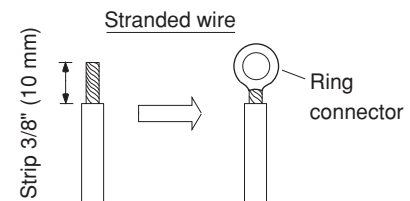


**Fig. 28**
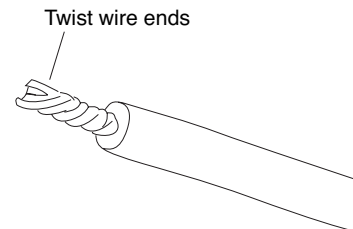


**Fig. 29**
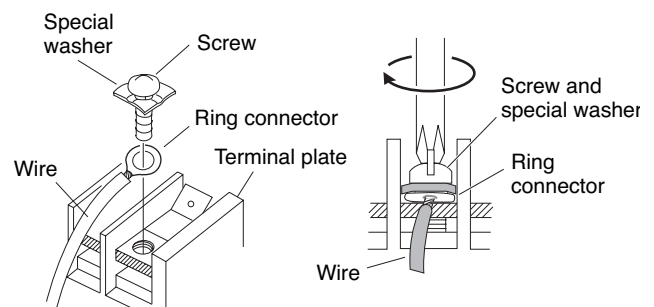


**Fig. 30**

## 5-5. Wiring Instructions for the Outdoor Unit

⚠ **CAUTION**

● Be sure to correctly align inter-unit cables A, B, C and D.
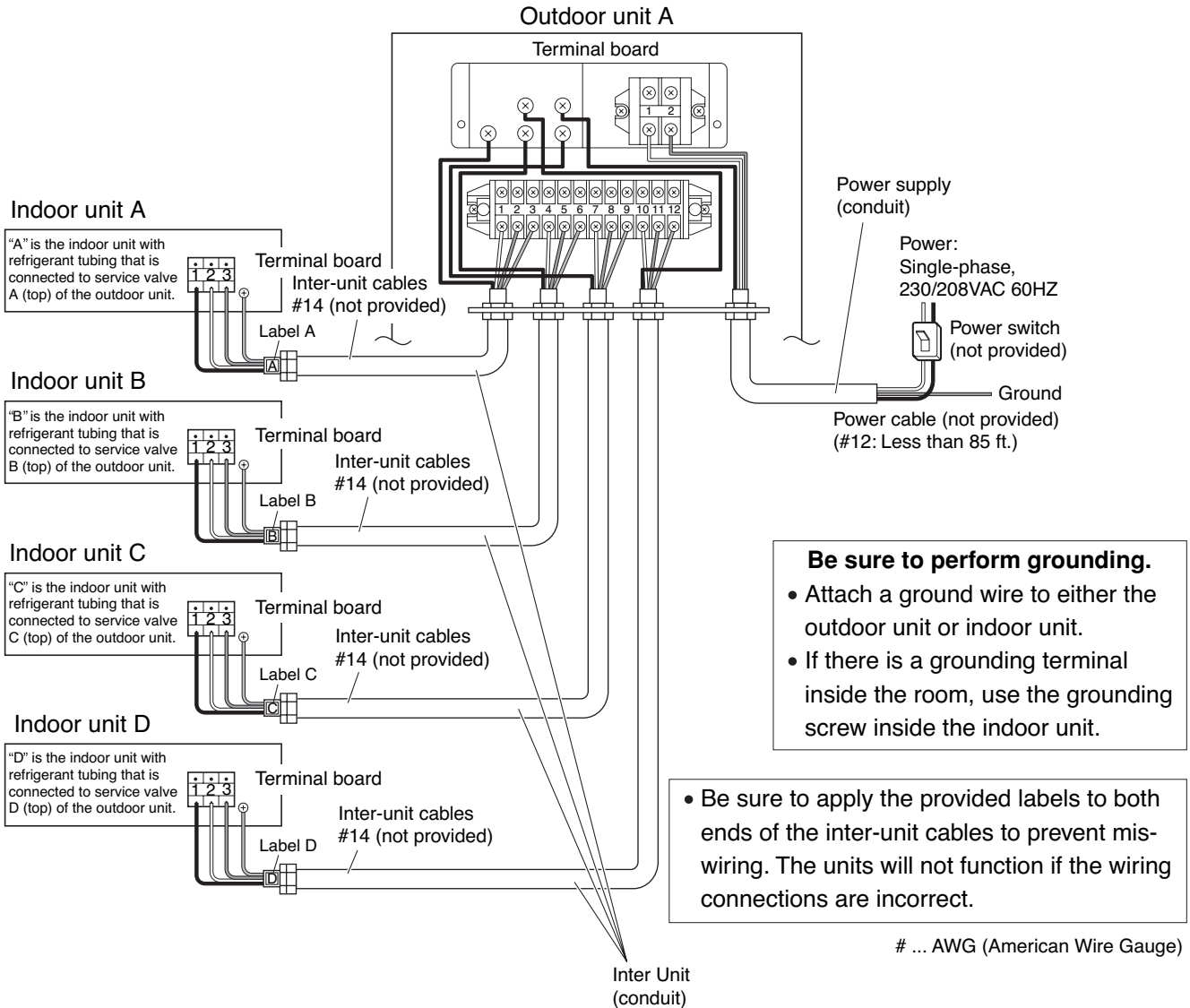


**Fig. 31**

● Use a dedicated A/C circuit for power.
● To make connections to the outdoor unit, remove the inspection panel and tubing panel.
● Do not bring the inter-unit cables or power cable into contact with tubing or service valves.
● Use outdoor unit cable fasteners and fasten the inter-unit cables at the location where the cables are double-sheathed.
● Arrange the wiring so that the inter-unit cables are contained in the inspection panel and tubing panel, as shown in Fig. 31.

Regulations on wire size differ from locality to locality. For field wiring requirements, please refer to your local electrical codes. Make sure that the installation fully complies with all local and national regulations.

(1) Remove access panel "C". (Fig. 32)

(2) Connect the inter-unit and power supply line according to the drawing on the panel side.

(3) Be sure to size each wire allowing approx. 4" (10 cm) longer than the required length for wiring. Store excess wiring inside the cabinet.

(4) When connections are completed, check that all connections are correct as shown in the wiring system diagram on panel side.

(5) Be sure to ground the unit according to your local codes.

## 6. Test Run

### Performing a test run

● Refer to the test run procedures in the indoor unit installation manual.

● Perform the test run separately for each connected indoor unit. If 2 units are operated simultaneously, it is not possible to correctly check for errors in tubing and wiring.

### Checking tubing and wiring

Perform the test run and check that operation is normal. If there is an error in tubing or wiring, the refrigerant may flow to indoor unit B when indoor unit A is operated (for example).

⚠ **CAUTION**

● Stop operation immediately if there is an error in tubing or wiring. Turn the power (breaker) to OFF, and check whether the inter-unit cables are connected incorrectly, or whether the narrow tubes A and B are connected in reverse. Correct the connections.

● If there is an error in tubing, pump-down must be performed. Be sure to perform pump-down. After making corrections, again purge the air from the tubes.



**Fig. 32**



⚠ **CAUTION**
Make sure there is no gap between access panel "C" and the conduit plate.
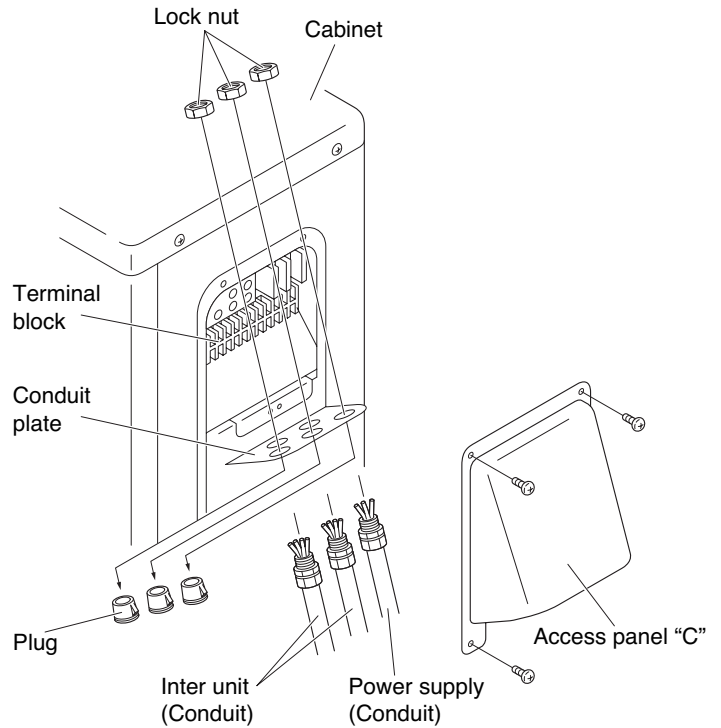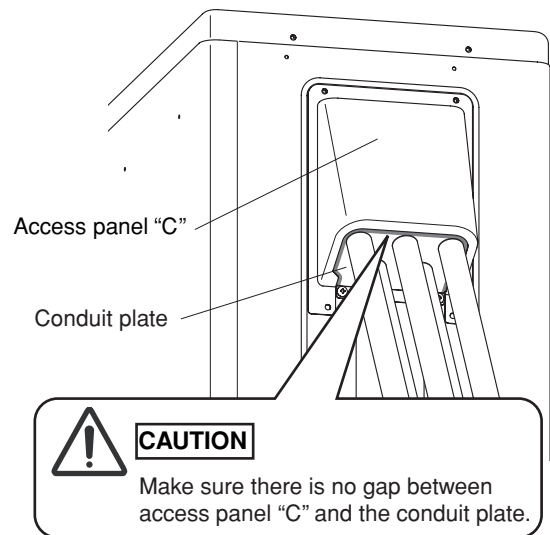
**Fig. 33**

## 7. Connecting a Home Automation device

The HA (white) 4P terminal is located on the indoor unit PCB. If a HA device will be used, connect it to this terminal.

## 8. Installation Check Sheet

☐ The strength of the installation location is sufficient to support the A/C weight.

☐ The indoor and outdoor units are installed level and vertically.

☐ The power and voltage are as specified.

☐ Inter-unit cables are securely fastened to the terminal board.

☐ Inter-unit cables are securely fixed.

☐ The power cord and inter-unit cables are not connected anywhere along their paths.

☐ The ground wire is securely connected.

☐ An air purge of the refrigerant circuit has been conducted.

☐ A leak test of the tubing connections has been performed.

☐ Thermal insulation has been applied to the tubing connections.

☐ Drain connections are secure and water drains properly.

☐ Putty has been used to close the hole in the wall.

☐ All service valves are fully open.

☐ Remote controller signals are being positively received.

# APPENDIX B  UNIT COMBINATION TABLES

< List of Combination Tables >

| Name of Combination Table | Model No. of Outdoor Unit | Remarks |
|---|---|---|
| 3-Room Outdoor Unit Combination Table | CLM1972 | OI-852-6-4180-827-00-0 |
| 4-Room Outdoor Unit Combination Table | CLM2472 | OI-852-6-4180-828-00-0 |
| 4-Room Outdoor Unit Combination Table | CLM3172 | OI-852-6-4180-829-00-0 |

**NOTE**

Be sure to operate the air conditioning system only when 2 or more indoor units have been installed. If operated with only a single unit installed, the returning fluid to the compressor may cause a malfunction.

**Save this Combination Table!**

**Please be sure to hand over this sheet to the user.**

**SANYO**

## 3-Room Outdoor Unit Combination Table

### CLM1972

#### <Combinations of Connectable Indoor Units>

The combinations of the indoor units listed in Table 1 and Table 2 are combinations solely of those units which can be operated concurrently. In addition to the combinations listed in the table, other combinations of indoor units are possible provided that the following conditions are satisfied.

### Conditions:

1. At least two or more indoor units must be connected to the multi outdoor unit. It is not acceptable for only one indoor unit to be connected.
2. The total rated cooling capacity of the indoor units to be connected must be no more than 200% of the rated cooling capacity of the outdoor unit.

⚠ **CAUTION**  **In this case, all the indoor units installed must not be operated concurrently under any circumstances. Otherwise, the air conditioner may not run properly and trouble may occur.**

Example: When 3 indoor units are connected

at 230V  If the following holds true
- Rated cooling capacity of CLM1972 outdoor unit: C=19700 (BTU/h)
- Rated cooling capacity of indoor units: K1, K2, ... (BTU/h)

Then:
$C \times 2 (200\%) \geqq K1 + K2 + .......$
$19700 \times 2 \geqq 7500 + 11900 + 17500$
$39400 \geqq 36900$

It is therefore possible to connect 3 units with respective capacities of 7500 + 11900 + 17500.
However, since this combination is not found in the 3-room operation column of Table 1, operating all these units concurrently may result in trouble. At a time like this, shut down at least one of the 3 indoor units to match one of the combinations found in the 2-room operation column of Table 1.

at 208V  If the following holds true
- Rated cooling capacity of CLM1972 outdoor unit: C=19700 (BTU/h)
- Rated cooling capacity of indoor units: K1, K2, ... (BTU/h)

Then:
$C \times 2 (200\%) \geqq K1 + K2 + .......$
$19700 \times 2 \geqq 7500 + 11900 + 17500$
$39400 \geqq 36900$

It is therefore possible to connect 3 units with respective capacities of 7500 + 11900 + 17500.
However, since this combination is not found in the 3-room operation column of Table 2, operating all these units concurrently may result in trouble. At a time like this, shut down at least one of the 3 indoor units to match one of the combinations found in the 2-room operation column of Table 2.

**NOTE**  Be sure to operate the air conditioning system only when 2 or more indoor units have been installed. If operated with only a single unit installed, the returning fluid to the compressor may cause a malfunction.

# < Combinations of operatable indoor units >

## Voltage Rating : 230V  60Hz

## CLM1972

(Rated cooling capacity at 230V: 19700 BTU/h)

**Table 1**

| | Indoor Unit Combination | | | | | Indoor Unit Capacity (BTU/h) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | COOLING | | | | | | | |
| | | | | | | Room A | Room B | Room C | Total Performance | | | | |
| | | | | | | | | | Capacity | ( | Min. | – | Max. ) |
| Single-room Operation | 7500 | | | = | 7500 | 7500 | | | 7500 | ( | 4700 | – | 8800 ) |
| | 9000 | | | = | 9000 | 9000 | | | 9000 | ( | 4700 | – | 10900 ) |
| | 11900 | | | = | 11900 | 11900 | | | 11900 | ( | 5100 | – | 12200 ) |
| | 17500 | | | = | 17500 | 17500 | | | 17500 | ( | 5400 | – | 19700 ) |
| 2-room Operation | 7500 + | 7500 | | = | 15000 | 7500 | 7500 | | 15000 | ( | 6800 | – | 17400 ) |
| | 7500 + | 9000 | | = | 16500 | 7485 | 9015 | | 16500 | ( | 6800 | – | 19700 ) |
| | 7500 + | 11900 | | = | 19400 | 6716 | 10684 | | 17400 | ( | 6800 | – | 19700 ) |
| | 7500 + | 17500 | | = | 25000 | 5717 | 13383 | | 19100 | ( | 7100 | – | 19700 ) |
| | 9000 + | 9000 | | = | 18000 | 8500 | 8500 | | 17000 | ( | 6800 | – | 19700 ) |
| | 9000 + | 11900 | | = | 20900 | 7713 | 10187 | | 17900 | ( | 6800 | – | 19700 ) |
| | 9000 + | 17500 | | = | 26500 | 6659 | 12941 | | 19600 | ( | 7100 | – | 19700 ) |
| | 11900 + | 11900 | | = | 23800 | 9350 | 9350 | | 18700 | ( | 6800 | – | 19700 ) |
| | 11900 + | 17500 | | = | 29400 | 7971 | 11729 | | 19700 | ( | 7100 | – | 19700 ) |
| 3-room Operation | 7500 + | 7500 + | 7500 | = | 22500 | 6133 | 6133 | 6133 | 18400 | ( | 8500 | – | 19700 ) |
| | 7500 + | 7500 + | 9000 | = | 24000 | 5835 | 5835 | 7029 | 18700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 7500 + | 11900 | = | 26900 | 5458 | 5458 | 8684 | 19600 | ( | 9800 | – | 19700 ) |
| | 7500 + | 7500 + | 17500 | = | 32500 | 4538 | 4538 | 10624 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 9000 + | 9000 | = | 25500 | 5779 | 6961 | 6961 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 9000 + | 11900 | = | 28400 | 5190 | 6252 | 8257 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 9000 + | 17500 | = | 34000 | 4334 | 5221 | 10146 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 11900 + | 11900 | = | 31300 | 4711 | 7495 | 7495 | 19700 | ( | 9800 | – | 19700 ) |
| | 9000 + | 9000 + | 9000 | = | 27000 | 6567 | 6567 | 6567 | 19700 | ( | 9800 | – | 19700 ) |
| | 9000 + | 9000 + | 11900 | = | 29900 | 5932 | 5932 | 7835 | 19700 | ( | 9800 | – | 19700 ) |
| | 9000 + | 11900 + | 11900 | = | 32800 | 5410 | 7145 | 7145 | 19700 | ( | 9800 | – | 19700 ) |
| | 11900 + | 11900 + | 11900 | = | 35700 | 6567 | 6567 | 6567 | 19700 | ( | 9800 | – | 19700 ) |

● The table lists the wall-mounted type of indoor units as representative models.

# Voltage Rating : 208V 60Hz

## CLM1972
### (Rated cooling capacity at 208V: 19700 BTU/h)

**Table 2**

| | Indoor Unit Combination | | | | | Indoor Unit Capacity (BTU/h) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | COOLING | | | | |
| | | | | | | Room A | Room B | Room C | Total Performance | | | | |
| | | | | | | | | | Capacity | ( | Min. | – | Max. ) |
| Single-room Operation | 7500 | | | = | 7500 | 7500 | | | 7500 | ( | 4700 | – | 8800 ) |
| | 9000 | | | = | 9000 | 9000 | | | 9000 | ( | 4700 | – | 10900 ) |
| | 11900 | | | = | 11900 | 11900 | | | 11900 | ( | 5100 | – | 12200 ) |
| | 17500 | | | = | 17500 | 17500 | | | 17500 | ( | 5400 | – | 19700 ) |
| 2-room Operation | 7500 + | 7500 | | = | 15000 | 7500 | 7500 | | 15000 | ( | 6800 | – | 17400 ) |
| | 7500 + | 9000 | | = | 16500 | 7485 | 9015 | | 16500 | ( | 6800 | – | 19700 ) |
| | 7500 + | 11900 | | = | 19400 | 6716 | 10684 | | 17400 | ( | 6800 | – | 19700 ) |
| | 7500 + | 17500 | | = | 25000 | 5717 | 13383 | | 19100 | ( | 7100 | – | 19700 ) |
| | 9000 + | 9000 | | = | 18000 | 8500 | 8500 | | 17000 | ( | 6800 | – | 19700 ) |
| | 9000 + | 11900 | | = | 20900 | 7713 | 10187 | | 17900 | ( | 6800 | – | 19700 ) |
| | 9000 + | 17500 | | = | 26500 | 6659 | 12941 | | 19600 | ( | 7100 | – | 19700 ) |
| | 11900 + | 11900 | | = | 23800 | 9350 | 9350 | | 18700 | ( | 6800 | – | 19700 ) |
| | 11900 + | 17500 | | = | 29400 | 7971 | 11729 | | 19700 | ( | 7100 | – | 19700 ) |
| 3-room Operation | 7500 + | 7500 + | 7500 | = | 22500 | 6133 | 6133 | 6133 | 18400 | ( | 8500 | – | 19700 ) |
| | 7500 + | 7500 + | 9000 | = | 24000 | 5835 | 5835 | 7029 | 18700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 7500 + | 11900 | = | 26900 | 5458 | 5458 | 8684 | 19600 | ( | 9800 | – | 19700 ) |
| | 7500 + | 7500 + | 17500 | = | 32500 | 4538 | 4538 | 10624 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 9000 + | 9000 | = | 25500 | 5779 | 6961 | 6961 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 9000 + | 11900 | = | 28400 | 5190 | 6252 | 8257 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 9000 + | 17500 | = | 34000 | 4334 | 5221 | 10146 | 19700 | ( | 9800 | – | 19700 ) |
| | 7500 + | 11900 + | 11900 | = | 31300 | 4711 | 7495 | 7495 | 19700 | ( | 9800 | – | 19700 ) |
| | 9000 + | 9000 + | 9000 | = | 27000 | 6567 | 6567 | 6567 | 19700 | ( | 9800 | – | 19700 ) |
| | 9000 + | 9000 + | 11900 | = | 29900 | 5932 | 5932 | 7835 | 19700 | ( | 9800 | – | 19700 ) |
| | 9000 + | 11900 + | 11900 | = | 32800 | 5410 | 7145 | 7145 | 19700 | ( | 9800 | – | 19700 ) |
| | 11900 + | 11900 + | 11900 | = | 35700 | 6567 | 6567 | 6567 | 19700 | ( | 9800 | – | 19700 ) |

● The table lists the wall-mounted type of indoor units as representative models.

**Save this Combination Table!**

**Please be sure to hand over this sheet to the user.**

**SANYO**

# 4-Room Outdoor Unit Combination Table

## CLM2472

### <Combinations of Connectable Indoor Units>

The combinations of the indoor units listed in Table 1 and Table 2 are combinations solely of those units which can be operated concurrently. In addition to the combinations listed in the table, other combinations of indoor units are possible provided that the following conditions are satisfied.

### Conditions:

1.  At least two or more indoor units must be connected to the multi outdoor unit. It is not acceptable for only one indoor unit to be connected.
2.  The total rated cooling capacity of the indoor units to be connected must be no more than 200% of the rated cooling capacity of the outdoor unit.

⚠ **CAUTION**  **In this case, all the indoor units installed must not be operated concurrently under any circumstances. Otherwise, the air conditioner may not run properly and trouble may occur.**

Example: When 4 indoor units are connected

at 230V   If the following holds true
- Rated cooling capacity of CLM2472 outdoor unit: C=25400 (BTU/h)
- Rated cooling capacity of indoor units: K1, K2, ... (BTU/h)

Then:
$$C \times 2 \ (200\%) \geqq K1 + K2 + .......$$
$$25400 \times 2 \geqq 7500 + 7500 + 7500 + 17500$$
$$50800 \geqq 40000$$

It is therefore possible to connect 4 units with respective capacities of 7500 + 7500 + 7500 + 17500.
However, since this combination is not found in the 4-room operation column of Table 1, operating all these units concurrently may result in trouble. At a time like this, shut down at least one of the 4 indoor units to match one of the combinations found in the 3-room operation column of Table 1.

at 208V   If the following holds true
- Rated cooling capacity of CLM2472 outdoor unit: C=24400 (BTU/h)
- Rated cooling capacity of indoor units: K1, K2, ... (BTU/h)

Then:
$$C \times 2 \ (200\%) \geqq K1 + K2 + .......$$
$$24400 \times 2 \geqq 7500 + 7500 + 7500 + 17500$$
$$48800 \geqq 40000$$

It is therefore possible to connect 4 units with respective capacities of 7500 + 7500 + 7500 + 17500.
However, since this combination is not found in the 4-room operation column of Table 2, operating all these units concurrently may result in trouble. At a time like this, shut down at least one of the 4 indoor units to match one of the combinations found in the 3-room operation column of Table 2.

**NOTE**  Be sure to operate the air conditioning system only when 2 or more indoor units have been installed. If operated with only a single unit installed, the returning fluid to the compressor may cause a malfunction.

# < Combinations of operatable indoor units >

## Voltage Rating : 230V  60Hz

## CLM2472
(Rated cooling capacity at 230V: 25400 BTU/h)

**Table 1**

| | Indoor Unit Combination | | | | Indoor Unit Capacity  (BTU/h) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | COOLING | | | | | | | |
| | | | | | Room A | Room B | Room C | Room D | Total Performance | | | |
| | | | | | | | | | Capacity | ( Min. | – | Max. ) |
| Single-room Operation | 7500 | | = | 7500 | 7500 | | | | 7500 | ( 4700 | – | 8800 ) |
| | 9000 | | = | 9000 | 9000 | | | | 9000 | ( 4700 | – | 10900 ) |
| | 11900 | | = | 11900 | 11900 | | | | 11900 | ( 5100 | – | 12200 ) |
| | 17500 | | = | 17500 | 17500 | | | | 17500 | ( 5400 | – | 19700 ) |
| | 24200 | | = | 24200 | 23200 | | | | 23200 | ( 5400 | – | 23200 ) |
| 2-room Operation | 7500 + | 7500 | = | 15000 | 7500 | 7500 | | | 15000 | ( 6800 | – | 17400 ) |
| | 7500 + | 9000 | = | 16500 | 7485 | 9015 | | | 16500 | ( 6800 | – | 19700 ) |
| | 7500 + | 11900 | = | 19400 | 7488 | 11912 | | | 19400 | ( 6800 | – | 22800 ) |
| | 7500 + | 17500 | = | 25000 | 7124 | 16676 | | | 23800 | ( 7100 | – | 25200 ) |
| | 7500 + | 24200 | = | 31700 | 6009 | 19391 | | | 25400 | ( 7100 | – | 25400 ) |
| | 9000 + | 9000 | = | 18000 | 9000 | 9000 | | | 18000 | ( 6800 | – | 21400 ) |
| | 9000 + | 11900 | = | 20900 | 8876 | 11724 | | | 20600 | ( 6800 | – | 23200 ) |
| | 9000 + | 17500 | = | 26500 | 8494 | 16506 | | | 25000 | ( 7100 | – | 25400 ) |
| | 9000 + | 24200 | = | 33200 | 6904 | 18496 | | | 25400 | ( 7100 | – | 25400 ) |
| | 11900 + | 11900 | = | 23800 | 11400 | 11400 | | | 22800 | ( 6800 | – | 24800 ) |
| | 11900 + | 17500 | = | 29400 | 10277 | 15123 | | | 25400 | ( 7100 | – | 25400 ) |
| | 11900 + | 24200 | = | 36100 | 8387 | 17013 | | | 25400 | ( 7100 | – | 25400 ) |
| | 17500 + | 17500 | = | 35000 | 12700 | 12700 | | | 25400 | ( 7100 | – | 25400 ) |
| 3-room Operation | 7500 + | 7500 + | 7500 = | 22500 | 7333 | 7333 | 7333 | | 22000 | ( 8500 | – | 25400 ) |
| | 7500 + | 7500 + | 9000 = | 24000 | 7177 | 7177 | 8645 | | 23000 | ( 9800 | – | 25400 ) |
| | 7500 + | 7500 + | 11900 = | 26900 | 7073 | 7073 | 11253 | | 25400 | ( 9800 | – | 25400 ) |
| | 7500 + | 7500 + | 17500 = | 32500 | 5851 | 5851 | 13697 | | 25400 | ( 9800 | – | 25400 ) |
| | 7500 + | 9000 + | 9000 = | 25500 | 7099 | 8551 | 8551 | | 24200 | ( 9800 | – | 25400 ) |
| | 7500 + | 9000 + | 11900 = | 28400 | 6692 | 8061 | 10647 | | 25400 | ( 9800 | – | 25400 ) |
| | 7500 + | 9000 + | 17500 = | 34000 | 5588 | 6731 | 13081 | | 25400 | ( 9800 | – | 25400 ) |
| | 7500 + | 11900 + | 11900 = | 31300 | 6074 | 9663 | 9663 | | 25400 | ( 9800 | – | 25400 ) |
| | 7500 + | 11900 + | 17500 = | 36900 | 5150 | 8194 | 12056 | | 25400 | ( 9800 | – | 25400 ) |
| | 9000 + | 9000 + | 9000 = | 27000 | 8467 | 8467 | 8467 | | 25400 | ( 9800 | – | 25400 ) |
| | 9000 + | 9000 + | 11900 = | 29900 | 7649 | 7649 | 10102 | | 25400 | ( 9800 | – | 25400 ) |
| | 9000 + | 9000 + | 17500 = | 35500 | 6441 | 6441 | 12518 | | 25400 | ( 9800 | – | 25400 ) |
| | 9000 + | 11900 + | 11900 = | 32800 | 6975 | 9212 | 9212 | | 25400 | ( 9800 | – | 25400 ) |
| | 9000 + | 11900 + | 17500 = | 38400 | 5957 | 7867 | 11576 | | 25400 | ( 9800 | – | 25400 ) |
| | 11900 + | 11900 + | 11900 = | 35700 | 8467 | 8467 | 8467 | | 25400 | ( 9800 | – | 25400 ) |
| | 11900 + | 11900 + | 17500 = | 41300 | 7317 | 7317 | 10766 | | 25400 | ( 9800 | – | 25400 ) |
| 4-room Operation | | | | | | | | | | | | |

**IMPORTANT!** **(Concurrent operation of 4 indoor units prohibited)**
This multi outdoor unit allows up to four indoor units to be connected.
However, all four indoor units must not be operated concurrently.
Otherwise, the air conditioner may not run properly.
Up to three indoor units may be operated concurrently.

● The table lists the wall-mounted type of indoor units as representative models.

# Voltage Rating : 208V  60Hz

## CLM2472

(Rated cooling capacity at 208V: 24400 BTU/h)

**Table 2**

| | Indoor Unit Combination | | | Indoor Unit Capacity (BTU/h) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | COOLING | | | | | | | |
| | | | | Room A | Room B | Room C | Room D | Total Performance | | | |
| | | | | | | | | Capacity | ( Min. | – Max. | ) |
| **Single-room Operation** | 7500 | = | 7500 | 7500 | | | | 7500 | ( 4700 | – 8800 | ) |
| | 9000 | = | 9000 | 9000 | | | | 9000 | ( 4700 | – 10900 | ) |
| | 11900 | = | 11900 | 11900 | | | | 11900 | ( 5100 | – 12200 | ) |
| | 17500 | = | 17500 | 17500 | | | | 17500 | ( 5400 | – 19700 | ) |
| | 24200 | = | 24200 | 22400 | | | | 22400 | ( 5400 | – 22400 | ) |
| **2-room Operation** | 7500 + 7500 | = | 15000 | 7500 | 7500 | | | 15000 | ( 6800 | – 17400 | ) |
| | 7500 + 9000 | = | 16500 | 7485 | 9015 | | | 16500 | ( 6800 | – 19700 | ) |
| | 7500 + 11900 | = | 19400 | 7488 | 11912 | | | 19400 | ( 6800 | – 22800 | ) |
| | 7500 + 17500 | = | 25000 | 7124 | 16676 | | | 23800 | ( 7100 | – 24200 | ) |
| | 7500 + 24200 | = | 31700 | 5772 | 18628 | | | 24400 | ( 7100 | – 24400 | ) |
| | 9000 + 9000 | = | 18000 | 9000 | 9000 | | | 18000 | ( 6800 | – 21400 | ) |
| | 9000 + 11900 | = | 20900 | 8876 | 11724 | | | 20600 | ( 6800 | – 23200 | ) |
| | 9000 + 17500 | = | 26500 | 8290 | 16110 | | | 24400 | ( 7100 | – 24400 | ) |
| | 9000 + 24200 | = | 33200 | 6632 | 17768 | | | 24400 | ( 7100 | – 24400 | ) |
| | 11900 + 11900 | = | 23800 | 11400 | 11400 | | | 22800 | ( 6800 | – 23200 | ) |
| | 11900 + 17500 | = | 29400 | 9873 | 14527 | | | 24400 | ( 7100 | – 24400 | ) |
| | 11900 + 24200 | = | 36100 | 8057 | 16343 | | | 24400 | ( 7100 | – 24400 | ) |
| | 17500 + 17500 | = | 35000 | 12200 | 12200 | | | 24400 | ( 7100 | – 24400 | ) |
| **3-room Operation** | 7500 + 7500 + 7500 | = | 22500 | 7333 | 7333 | 7333 | | 22000 | ( 8500 | – 24200 | ) |
| | 7500 + 7500 + 9000 | = | 24000 | 7177 | 7177 | 8645 | | 23000 | ( 9800 | – 24200 | ) |
| | 7500 + 7500 + 11900 | = | 26900 | 6739 | 6739 | 10722 | | 24200 | ( 9800 | – 24400 | ) |
| | 7500 + 7500 + 17500 | = | 32500 | 5575 | 5575 | 13050 | | 24200 | ( 9800 | – 24400 | ) |
| | 7500 + 9000 + 9000 | = | 25500 | 7099 | 8551 | 8551 | | 24200 | ( 9800 | – 24200 | ) |
| | 7500 + 9000 + 11900 | = | 28400 | 6429 | 7744 | 10228 | | 24400 | ( 9800 | – 24400 | ) |
| | 7500 + 9000 + 17500 | = | 34000 | 5368 | 6466 | 12566 | | 24400 | ( 9800 | – 24400 | ) |
| | 7500 + 11900 + 11900 | = | 31300 | 5835 | 9283 | 9283 | | 24400 | ( 9800 | – 24400 | ) |
| | 7500 + 11900 + 17500 | = | 36900 | 4947 | 7871 | 11582 | | 24400 | ( 9800 | – 24400 | ) |
| | 9000 + 9000 + 9000 | = | 27000 | 8133 | 8133 | 8133 | | 24400 | ( 9800 | – 24400 | ) |
| | 9000 + 9000 + 11900 | = | 29900 | 7348 | 7348 | 9705 | | 24400 | ( 9800 | – 24400 | ) |
| | 9000 + 9000 + 17500 | = | 35500 | 6188 | 6188 | 12025 | | 24400 | ( 9800 | – 24400 | ) |
| | 9000 + 11900 + 11900 | = | 32800 | 6701 | 8850 | 8850 | | 24400 | ( 9800 | – 24400 | ) |
| | 9000 + 11900 + 17500 | = | 38400 | 5722 | 7558 | 11120 | | 24400 | ( 9800 | – 24400 | ) |
| | 11900 + 11900 + 11900 | = | 35700 | 8133 | 8133 | 8133 | | 24400 | ( 9800 | – 24400 | ) |
| | 11900 + 11900 + 17500 | = | 41300 | 7029 | 7029 | 10342 | | 24400 | ( 9800 | – 24400 | ) |
| **4-room Operation** | | | | | | | | | | | |

**IMPORTANT!** **(Concurrent operation of 4 indoor units prohibited)**
This multi outdoor unit allows up to four indoor units to be connected.
However, all four indoor units must not be operated concurrently.
Otherwise, the air conditioner may not run properly.
Up to three indoor units may be operated concurrently.

● The table lists the wall-mounted type of indoor units as representative models.

**Save this Combination Table!**

**Please be sure to hand over this sheet to the user.**

**SANYO**

## 4-Room Outdoor Unit Combination Table

## CLM3172

### <Combinations of Connectable Indoor Units>

The combinations of the indoor units listed in Table 1 and Table 2 are combinations solely of those units which can be operated concurrently. In addition to the combinations listed in the table, other combinations of indoor units are possible provided that the following conditions are satisfied.

### Conditions:

1. At least two or more indoor units must be connected to the multi outdoor unit. It is not acceptable for only one indoor unit to be connected.
2. The total rated cooling capacity of the indoor units to be connected must be no more than 200% of the rated cooling capacity of the outdoor unit.

⚠ **CAUTION** **In this case, all the indoor units installed must not be operated concurrently under any circumstances. Otherwise, the air conditioner may not run properly and trouble may occur.**

Example: When 4 indoor units are connected

at 230V  If the following holds true
- Rated cooling capacity of CLM3172 outdoor unit: C=30600 (BTU/h)
- Rated cooling capacity of indoor units: K1, K2, ... (BTU/h)

Then:
$C \times 2 (200\%) \geqq K1 + K2 + .......$
$30600 \times 2 \geqq 7500 + 7500 + 11900 + 24200$
$61200 \geqq 51100$

It is therefore possible to connect 4 units with respective capacities of 7500 + 7500 + 11900 + 24200.
However, since this combination is not found in the 4-room operation column of Table 1, operating all these units concurrently may result in trouble. At a time like this, shut down at least one of the 4 indoor units to match one of the combinations found in the 3-room operation column of Table 1.

at 208V  If the following holds true
- Rated cooling capacity of CLM3172 outdoor unit: C=28600 (BTU/h)
- Rated cooling capacity of indoor units: K1, K2, ... (BTU/h)

Then:
$C \times 2 (200\%) \geqq K1 + K2 + .......$
$28600 \times 2 \geqq 7500 + 7500 + 11900 + 24200$
$57200 \geqq 51100$

It is therefore possible to connect 4 units with respective capacities of 7500 + 7500 + 11900 + 24200.
However, since this combination is not found in the 4-room operation column of Table 2, operating all these units concurrently may result in trouble. At a time like this, shut down at least one of the 4 indoor units to match one of the combinations found in the 3-room operation column of Table 2.

**NOTE** Be sure to operate the air conditioning system only when 2 or more indoor units have been installed.
If operated with only a single unit installed, the returning fluid to the compressor may cause a malfunction.

# < Combinations of operatable indoor units >
## Voltage Rating : 230V  60Hz

## CLM3172
### (Rated cooling capacity at 230V: 30600 BTU/h)

**NOTE**

7500 : KMS0772
9000 : KMS0972
11900 : KMS1272
17500 : KMS1872
24200 : KMS2472

**Table 1**

| Indoor Unit Combination | = | Room A | Room B | Room C | Room D | Total Performance Capacity | ( Min. – Max. ) |
|---|---|---|---|---|---|---|---|
| **Single-room Operation** | | | | | | | |
| 7500 | = 7500 | 7500 | | | | 7500 | ( 4000 – 8800 ) |
| 9000 | = 9000 | 9000 | | | | 9000 | ( 4400 – 10900 ) |
| 11900 | = 11900 | 11900 | | | | 11900 | ( 4700 – 12200 ) |
| 17500 | = 17500 | 17500 | | | | 17500 | ( 5100 – 19700 ) |
| 24200 | = 24200 | 24200 | | | | 24200 | ( 5400 – 25200 ) |
| **2-room Operation** | | | | | | | |
| 7500 + 7500 | = 15000 | 7500 | 7500 | | | 15000 | ( 4400 – 17400 ) |
| 7500 + 9000 | = 16500 | 7500 | 9000 | | | 16500 | ( 5100 – 19700 ) |
| 7500 + 11900 | = 19400 | 7500 | 11900 | | | 19400 | ( 5800 – 22800 ) |
| 7500 + 17500 | = 25000 | 7320 | 17080 | | | 24400 | ( 7500 – 26200 ) |
| 7500 + 24200 | = 31700 | 6625 | 21375 | | | 28000 | ( 7800 – 30000 ) |
| 9000 + 9000 | = 18000 | 9000 | 9000 | | | 18000 | ( 5800 – 22000 ) |
| 9000 + 11900 | = 20900 | 8957 | 11843 | | | 20800 | ( 6400 – 25200 ) |
| 9000 + 17500 | = 26500 | 8626 | 16774 | | | 25400 | ( 7800 – 29000 ) |
| 9000 + 24200 | = 33200 | 7861 | 21139 | | | 29000 | ( 7800 – 30000 ) |
| 11900 + 11900 | = 23800 | 11900 | 11900 | | | 23800 | ( 7500 – 28600 ) |
| 11900 + 17500 | = 29400 | 10848 | 15952 | | | 26800 | ( 8800 – 30000 ) |
| 11900 + 24200 | = 36100 | 9625 | 19575 | | | 29200 | ( 8800 – 30000 ) |
| 17500 + 17500 | = 35000 | 14500 | 14500 | | | 29000 | ( 8800 – 30000 ) |
| 17500 + 24200 | = 41700 | 12296 | 17004 | | | 29300 | ( 9200 – 30000 ) |
| **3-room Operation** | | | | | | | |
| 7500 + 7500 + 7500 | = 22500 | 7467 | 7467 | 7467 | | 22400 | ( 6800 – 26200 ) |
| 7500 + 7500 + 9000 | = 24000 | 7500 | 7500 | 9000 | | 24000 | ( 7500 – 26600 ) |
| 7500 + 7500 + 11900 | = 26900 | 7082 | 7082 | 11236 | | 25400 | ( 8100 – 26800 ) |
| 7500 + 7500 + 17500 | = 32500 | 6600 | 6600 | 15400 | | 28600 | ( 9200 – 30600 ) |
| 7500 + 7500 + 24200 | = 39200 | 5587 | 5587 | 18027 | | 29200 | ( 9800 – 30600 ) |
| 7500 + 9000 + 9000 | = 25500 | 7294 | 8753 | 8753 | | 24800 | ( 7800 – 27200 ) |
| 7500 + 9000 + 11900 | = 28400 | 6972 | 8366 | 11062 | | 26400 | ( 8800 – 27600 ) |
| 7500 + 9000 + 17500 | = 34000 | 6309 | 7571 | 14721 | | 28600 | ( 9800 – 30600 ) |
| 7500 + 9000 + 24200 | = 40700 | 5381 | 6457 | 17362 | | 29200 | ( 9800 – 30600 ) |
| 7500 + 11900 + 11900 | = 31300 | 6613 | 10493 | 10493 | | 27600 | ( 9200 – 28600 ) |
| 7500 + 11900 + 17500 | = 36900 | 5935 | 9417 | 13848 | | 29200 | ( 9800 – 30600 ) |
| 7500 + 11900 + 24200 | = 43600 | 5023 | 7970 | 16207 | | 29200 | ( 9800 – 30600 ) |
| 7500 + 17500 + 17500 | = 42500 | 5153 | 12024 | 12024 | | 29200 | ( 9800 – 30600 ) |
| 7500 + 17500 + 24200 | = 49200 | 4451 | 10386 | 14363 | | 29200 | ( 9800 – 30600 ) |
| 9000 + 9000 + 9000 | = 27000 | 8533 | 8533 | 8533 | | 25600 | ( 8500 – 27200 ) |
| 9000 + 9000 + 11900 | = 29900 | 8187 | 8187 | 10825 | | 27200 | ( 9200 – 28200 ) |
| 9000 + 9000 + 17500 | = 35500 | 7352 | 7352 | 14296 | | 29000 | ( 9800 – 30600 ) |
| 9000 + 9000 + 24200 | = 42200 | 6185 | 6185 | 16630 | | 29000 | ( 9800 – 30600 ) |
| 9000 + 11900 + 11900 | = 32800 | 7848 | 10376 | 10376 | | 28600 | ( 9200 – 29200 ) |
| 9000 + 11900 + 17500 | = 38400 | 6844 | 9049 | 13307 | | 29200 | ( 9800 – 30600 ) |
| 9000 + 11900 + 24200 | = 45100 | 5827 | 7705 | 15668 | | 29200 | ( 9800 – 30600 ) |
| 9000 + 17500 + 17500 | = 44000 | 5973 | 11614 | 11614 | | 29200 | ( 9800 – 30600 ) |
| 11900 + 11900 + 11900 | = 35700 | 9267 | 9267 | 9267 | | 27800 | ( 9800 – 29000 ) |
| 11900 + 11900 + 17500 | = 41300 | 8414 | 8414 | 12373 | | 29200 | ( 9800 – 30600 ) |
| 11900 + 11900 + 24200 | = 48000 | 7239 | 7239 | 14722 | | 29200 | ( 9800 – 30600 ) |
| 11900 + 17500 + 17500 | = 46900 | 7409 | 10896 | 10896 | | 29200 | ( 9800 – 30600 ) |
| **4-room Operation** | | | | | | | |
| 7500 + 7500 + 7500 + 7500 | = 30000 | 6800 | 6800 | 6800 | 6800 | 27200 | ( 9800 – 28200 ) |
| 7500 + 7500 + 7500 + 9000 | = 31500 | 6667 | 6667 | 6667 | 8000 | 28000 | ( 9800 – 28200 ) |
| 7500 + 7500 + 7500 + 11900 | = 34400 | 6235 | 6235 | 6235 | 9894 | 28600 | ( 9800 – 28600 ) |
| 7500 + 7500 + 7500 + 17500 | = 40000 | 5738 | 5738 | 5738 | 13388 | 30600 | ( 9800 – 30600 ) |
| 7500 + 7500 + 7500 + 24200 | = 46700 | 4914 | 4914 | 4914 | 15857 | 30600 | ( 9800 – 30600 ) |
| 7500 + 7500 + 9000 + 9000 | = 33000 | 6409 | 6409 | 7691 | 7691 | 28200 | ( 9800 – 28200 ) |
| 7500 + 7500 + 9000 + 11900 | = 35900 | 6058 | 6058 | 7270 | 9613 | 29000 | ( 9800 – 29000 ) |
| 7500 + 7500 + 9000 + 17500 | = 41500 | 5530 | 5530 | 6636 | 12904 | 30600 | ( 9800 – 30600 ) |
| 7500 + 7500 + 9000 + 24200 | = 48200 | 4761 | 4761 | 5714 | 15363 | 30600 | ( 9800 – 30600 ) |
| 7500 + 7500 + 11900 + 11900 | = 38800 | 5915 | 5915 | 9385 | 9385 | 30600 | ( 9800 – 30600 ) |
| 7500 + 7500 + 11900 + 17500 | = 44400 | 5169 | 5169 | 8201 | 12061 | 30600 | ( 9800 – 30600 ) |
| 7500 + 7500 + 17500 + 17500 | = 50000 | 4590 | 4590 | 10710 | 10710 | 30600 | ( 9800 – 30600 ) |
| 7500 + 9000 + 9000 + 9000 | = 34500 | 6217 | 7461 | 7461 | 7461 | 28600 | ( 9800 – 28600 ) |
| 7500 + 9000 + 9000 + 11900 | = 37400 | 6136 | 7364 | 7364 | 9736 | 30600 | ( 9800 – 30600 ) |
| 7500 + 9000 + 9000 + 17500 | = 43000 | 5337 | 6405 | 6405 | 12453 | 30600 | ( 9800 – 30600 ) |
| 7500 + 9000 + 11900 + 11900 | = 40300 | 5695 | 6834 | 9036 | 9036 | 30600 | ( 9800 – 30600 ) |
| 7500 + 9000 + 11900 + 17500 | = 45900 | 5000 | 6000 | 7933 | 11667 | 30600 | ( 9800 – 30600 ) |
| 7500 + 11900 + 11900 + 11900 | = 43200 | 5313 | 8429 | 8429 | 8429 | 30600 | ( 9800 – 30600 ) |
| 7500 + 11900 + 11900 + 17500 | = 48800 | 4703 | 7462 | 7462 | 10973 | 30600 | ( 9800 – 30600 ) |
| 9000 + 9000 + 9000 + 9000 | = 36000 | 7650 | 7650 | 7650 | 7650 | 30600 | ( 9800 – 30600 ) |
| 9000 + 9000 + 9000 + 11900 | = 38900 | 7080 | 7080 | 7080 | 9361 | 30600 | ( 9800 – 30600 ) |
| 9000 + 9000 + 9000 + 17500 | = 44500 | 6189 | 6189 | 6189 | 12034 | 30600 | ( 9800 – 30600 ) |
| 9000 + 9000 + 11900 + 11900 | = 41800 | 6589 | 6589 | 8711 | 8711 | 30600 | ( 9800 – 30600 ) |
| 9000 + 9000 + 11900 + 17500 | = 47400 | 5810 | 5810 | 7682 | 11297 | 30600 | ( 9800 – 30600 ) |
| 9000 + 11900 + 11900 + 11900 | = 44700 | 6161 | 8146 | 8146 | 8146 | 30600 | ( 9800 – 30600 ) |
| 11900 + 11900 + 11900 + 11900 | = 47600 | 7650 | 7650 | 7650 | 7650 | 30600 | ( 9800 – 30600 ) |

● The table lists the wall-mounted type of indoor units as representative models.

# Voltage Rating : 208V  60Hz

## CLM3172
## (Rated cooling capacity at 208V: 28600 BTU/h)

**NOTE**

7500 : KMS0772
9000 : KMS0972
11900 : KMS1272
17500 : KMS1872
24200 : KMS2472

**Table 2**

| | Indoor Unit Combination | | Room A | Room B | Room C | Room D | Capacity | Min. – Max. |
|---|---|---|---|---|---|---|---|---|
| **Single-room Operation** | 7500 | = 7500 | 7500 | | | | 7500 | ( 4000 – 8800 ) |
| | 9000 | = 9000 | 9000 | | | | 9000 | ( 4400 – 10900 ) |
| | 11900 | = 11900 | 11900 | | | | 11900 | ( 4700 – 12200 ) |
| | 17500 | = 17500 | 17500 | | | | 17500 | ( 5100 – 19700 ) |
| | 24200 | = 24200 | 24200 | | | | 24200 | ( 5400 – 24800 ) |
| **2-room Operation** | 7500 + 7500 | = 15000 | 7500 | 7500 | | | 15000 | ( 4400 – 17400 ) |
| | 7500 + 9000 | = 16500 | 7500 | 9000 | | | 16500 | ( 5100 – 19700 ) |
| | 7500 + 11900 | = 19400 | 7500 | 11900 | | | 19400 | ( 5800 – 22800 ) |
| | 7500 + 17500 | = 25000 | 7320 | 17080 | | | 24400 | ( 7500 – 26200 ) |
| | 7500 + 24200 | = 31700 | 6625 | 21375 | | | 28000 | ( 7800 – 27600 ) |
| | 9000 + 9000 | = 18000 | 9000 | 9000 | | | 18000 | ( 5800 – 22000 ) |
| | 9000 + 11900 | = 20900 | 8957 | 11843 | | | 20800 | ( 6400 – 25200 ) |
| | 9000 + 17500 | = 26500 | 8626 | 16774 | | | 25400 | ( 7800 – 27600 ) |
| | 9000 + 24200 | = 33200 | 7373 | 19827 | | | 27200 | ( 7800 – 27600 ) |
| | 11900 + 11900 | = 23800 | 11900 | 11900 | | | 23800 | ( 7500 – 27600 ) |
| | 11900 + 17500 | = 29400 | 10848 | 15952 | | | 26800 | ( 8800 – 27600 ) |
| | 11900 + 24200 | = 36100 | 9098 | 18502 | | | 27600 | ( 8800 – 27600 ) |
| | 17500 + 17500 | = 35000 | 13600 | 13600 | | | 27200 | ( 8800 – 27600 ) |
| | 17500 + 24200 | = 41700 | 11583 | 16017 | | | 27600 | ( 9200 – 27600 ) |
| **3-room Operation** | 7500 + 7500 + 7500 | = 22500 | 7467 | 7467 | 7467 | | 22400 | ( 6800 – 24800 ) |
| | 7500 + 7500 + 9000 | = 24000 | 7500 | 7500 | 9000 | | 24000 | ( 7500 – 25200 ) |
| | 7500 + 7500 + 11900 | = 26900 | 6747 | 6747 | 10706 | | 24200 | ( 8100 – 25400 ) |
| | 7500 + 7500 + 17500 | = 32500 | 6185 | 6185 | 14431 | | 26800 | ( 9200 – 27600 ) |
| | 7500 + 7500 + 24200 | = 39200 | 5281 | 5281 | 17039 | | 27600 | ( 9800 – 27600 ) |
| | 7500 + 9000 + 9000 | = 25500 | 7118 | 8541 | 8541 | | 24200 | ( 7800 – 25400 ) |
| | 7500 + 9000 + 11900 | = 28400 | 6444 | 7732 | 10224 | | 24400 | ( 8800 – 25800 ) |
| | 7500 + 9000 + 17500 | = 34000 | 5912 | 7094 | 13794 | | 26800 | ( 9800 – 27600 ) |
| | 7500 + 9000 + 24200 | = 40700 | 5086 | 6103 | 16411 | | 27600 | ( 9800 – 27600 ) |
| | 7500 + 11900 + 11900 | = 31300 | 5799 | 9201 | 9201 | | 24200 | ( 9200 – 27600 ) |
| | 7500 + 11900 + 17500 | = 36900 | 5610 | 8901 | 13089 | | 27600 | ( 9800 – 27600 ) |
| | 7500 + 11900 + 24200 | = 43600 | 4748 | 7533 | 15319 | | 27600 | ( 9800 – 27600 ) |
| | 7500 + 17500 + 17500 | = 42500 | 4871 | 11365 | 11365 | | 27600 | ( 9800 – 27600 ) |
| | 7500 + 17500 + 24200 | = 49200 | 4207 | 9817 | 13576 | | 27600 | ( 9800 – 27600 ) |
| | 9000 + 9000 + 9000 | = 27000 | 8267 | 8267 | 8267 | | 24800 | ( 8500 – 26200 ) |
| | 9000 + 9000 + 11900 | = 29900 | 7284 | 7284 | 9631 | | 24200 | ( 9200 – 25400 ) |
| | 9000 + 9000 + 17500 | = 35500 | 6439 | 6439 | 12521 | | 25400 | ( 9800 – 27600 ) |
| | 9000 + 9000 + 24200 | = 42200 | 5886 | 5886 | 15827 | | 27600 | ( 9800 – 27600 ) |
| | 9000 + 11900 + 11900 | = 32800 | 6805 | 8998 | 8998 | | 24800 | ( 9200 – 26200 ) |
| | 9000 + 11900 + 17500 | = 38400 | 6469 | 8553 | 12578 | | 27600 | ( 9800 – 27600 ) |
| | 9000 + 11900 + 24200 | = 45100 | 5508 | 7282 | 14810 | | 27600 | ( 9800 – 27600 ) |
| | 9000 + 17500 + 17500 | = 44000 | 5645 | 10977 | 10977 | | 27600 | ( 9800 – 27600 ) |
| | 11900 + 11900 + 11900 | = 35700 | 8467 | 8467 | 8467 | | 25400 | ( 9800 – 27600 ) |
| | 11900 + 11900 + 17500 | = 41300 | 7953 | 7953 | 11695 | | 27600 | ( 9800 – 27600 ) |
| | 11900 + 11900 + 24200 | = 48000 | 6843 | 6843 | 13915 | | 27600 | ( 9800 – 27600 ) |
| | 11900 + 17500 + 17500 | = 46900 | 7003 | 10299 | 10299 | | 27600 | ( 9800 – 27600 ) |
| **4-room Operation** | 7500 + 7500 + 7500 + 7500 | = 30000 | 6300 | 6300 | 6300 | 6300 | 25200 | ( 9800 – 25200 ) |
| | 7500 + 7500 + 7500 + 9000 | = 31500 | 6048 | 6048 | 6048 | 7257 | 25400 | ( 9800 – 25400 ) |
| | 7500 + 7500 + 7500 + 11900 | = 34400 | 5625 | 5625 | 5625 | 8925 | 25800 | ( 9800 – 25800 ) |
| | 7500 + 7500 + 7500 + 17500 | = 40000 | 5363 | 5363 | 5363 | 12513 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 7500 + 7500 + 24200 | = 46700 | 4593 | 4593 | 4593 | 14821 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 7500 + 9000 + 9000 | = 33000 | 5864 | 5864 | 7036 | 7036 | 25800 | ( 9800 – 25800 ) |
| | 7500 + 7500 + 9000 + 11900 | = 35900 | 5557 | 5557 | 6669 | 8817 | 26600 | ( 9800 – 26600 ) |
| | 7500 + 7500 + 9000 + 17500 | = 41500 | 5169 | 5169 | 6202 | 12060 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 7500 + 9000 + 24200 | = 48200 | 4450 | 4450 | 5340 | 14359 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 7500 + 11900 + 11900 | = 38800 | 5528 | 5528 | 8772 | 8772 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 7500 + 11900 + 17500 | = 44400 | 4831 | 4831 | 7665 | 11273 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 7500 + 17500 + 17500 | = 50000 | 4290 | 4290 | 10010 | 10010 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 9000 + 9000 + 9000 | = 34500 | 5696 | 6835 | 6835 | 6835 | 26200 | ( 9800 – 26200 ) |
| | 7500 + 9000 + 9000 + 11900 | = 37400 | 5735 | 6882 | 6882 | 9100 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 9000 + 9000 + 17500 | = 43000 | 4988 | 5986 | 5986 | 11640 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 9000 + 11900 + 11900 | = 40300 | 5323 | 6387 | 8445 | 8445 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 9000 + 11900 + 17500 | = 45900 | 4673 | 5608 | 7415 | 10904 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 11900 + 11900 + 11900 | = 43200 | 4965 | 7878 | 7878 | 7878 | 28600 | ( 9800 – 28600 ) |
| | 7500 + 11900 + 11900 + 17500 | = 48800 | 4395 | 6974 | 6974 | 10256 | 28600 | ( 9800 – 28600 ) |
| | 9000 + 9000 + 9000 + 9000 | = 36000 | 7150 | 7150 | 7150 | 7150 | 28600 | ( 9800 – 28600 ) |
| | 9000 + 9000 + 9000 + 11900 | = 38900 | 6617 | 6617 | 6617 | 8749 | 28600 | ( 9800 – 28600 ) |
| | 9000 + 9000 + 9000 + 17500 | = 44500 | 5784 | 5784 | 5784 | 11247 | 28600 | ( 9800 – 28600 ) |
| | 9000 + 9000 + 11900 + 11900 | = 41800 | 6158 | 6158 | 8142 | 8142 | 28600 | ( 9800 – 28600 ) |
| | 9000 + 9000 + 11900 + 17500 | = 47400 | 5430 | 5430 | 7180 | 10559 | 28600 | ( 9800 – 28600 ) |
| | 9000 + 11900 + 11900 + 11900 | = 44700 | 5758 | 7614 | 7614 | 7614 | 28600 | ( 9800 – 28600 ) |
| | 11900 + 11900 + 11900 + 11900 | = 47600 | 7150 | 7150 | 7150 | 7150 | 28600 | ( 9800 – 28600 ) |

Indoor Unit Capacity (BTU/h) — COOLING — Total Performance

● The table lists the wall-mounted type of indoor units as representative models.